Historic, archived document

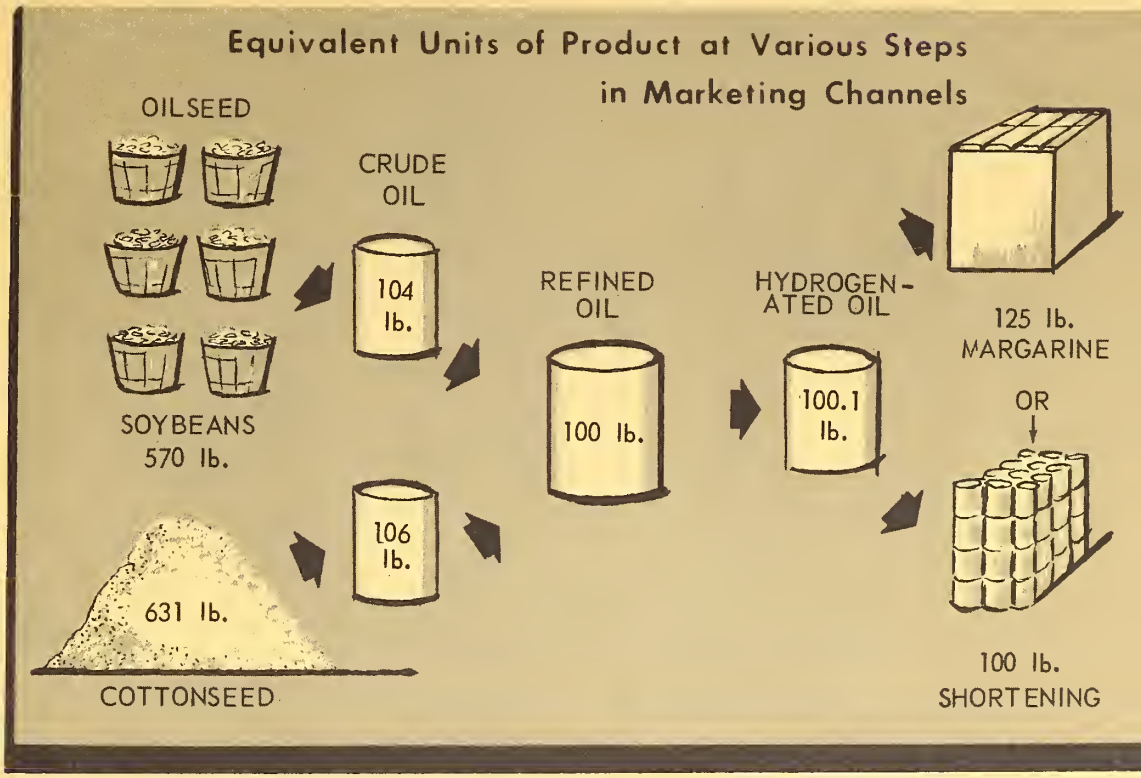
Do not assume content reflects current scientific knowledge, policies, or practices.

84Mr

Marketing Research Report No. 231

LIBRARY
MAY

Marketing Margins, Practices, and Costs for Soybean and Cottonseed Oils



Agricultural Marketing Service
Marketing Research Division
UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS

	Page
Preface	ii
Summary	1
Background	3
Oil values and marketing margins	10
Farm values for soybean and cottonseed oil	10
Oil processing margin	14
Trends in the overall marketing margin and oil values	15
Differences between oilseeds	16
Effect of seasonal movement of oilseeds on margins	17
Differences in margins between areas	23
Differences in retail values between cities	26
Marketing practices and costs for oilseeds and their products	27
Farm practices and costs	27
Milling practices and costs	30
Oil processing practices and costs	33
Margarine and shortening production and costs	37
Effect of margarine taxes on prices	44

May 1958

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 30 cents

PREFACE

This study is one of several from the Marketing Research Division concerned with marketing margins, practices, and costs for food items. It is part of a broad program of research designed to reduce the cost of marketing farm products. It supplies information on marketing practices and marketing charges for soybean and cottonseed oil from the time the oilseeds leave the farm until the oil reaches the consumer in the form of margarine or shortening.

This report is an amplification of a preliminary report on the same subject (AMS-109, U. S. Dept. Agr., Agr. Mktg. Serv.) released in January 1956. The earlier report compared marketing margins for November 1945 and November 1954. Now the study has been expanded to include both November and January for oils produced from the soybean and cottonseed crops of 1940, 1945, 1950, and 1955, and it includes a more complete discussion of marketing practices and costs that affect prices and margins. It also includes information on seasonal variations in prices and marketing margins for these two oilseeds and their products.

The study has assumed a fairly well standardized channeling of soybeans and cottonseed from the farm to the consumer. The analysis has been restricted to a single producing area for each oilseed for each of 4 consumption centers, New York City, Atlanta, Chicago, and Los Angeles. No attempt has been made to arrive at national averages for the various items of information studied. Such averages fail to answer some of the most significant questions, because of differences in characteristics between groups or sectors of the industry. Accordingly, the study of selected cases appears to offer greater illumination of the subject.

The marketing margins reported are based largely on average farm prices for soybeans and cottonseed reported to the Agricultural Marketing Service, and on weighted average retail prices for margarine and shortening sold in grocery stores, published by the Bureau of Labor Statistics. Other price and cost data from both published and unpublished sources were also used. Because price data come from various sources, and prices do not always adjust promptly to changed conditions, margins over a short time may show considerable variation. These irregularities adjust over a longer period to show trends in marketing costs.

MARKETING MARGINS, PRACTICES, AND COSTS FOR SOYBEAN AND COTTONSEED OILS

By Virginia Farnworth and Donald Jackson, agricultural economists
Marketing Research Division, Agricultural Marketing Service

SUMMARY

The whole period from 1940 forward has been one of rapid change in the vegetable oil industry. Nutritional value, sanitation, and attractiveness of products were improved. Technological improvements in oil processing and refining, shortages of fats and oils, and removal of Federal excise taxes on the production and sale of yellow margarine increased the demand for vegetable oil for use as food. New milling equipment and methods increased milling costs per unit of oilseed processed, but they increased yields of oil and gross returns even more. The vegetable oil industry expanded and integrated further to provide modern facilities and techniques for mass production and distribution. This expansion was accompanied by large increases in production of oilseeds.

Domestic and foreign demand for vegetable oils, inadequate supplies of cottonseed oil, need for an alternate crop in the Corn Belt, and Government price support programs contributed to the phenomenal growth in production of soybeans. In 1940 the soybean crop was less than 45 percent of the cottonseed crop of 10.6 billion pounds (5,286 tons), but by 1955 it exceeded the cottonseed crop by 83 percent, and it exceeded the soybean crop of 1940 by 378 percent. Cottonseed being a byproduct of a crop which was produced in excess of our domestic needs, cottonseed growers had no incentive to increase production in competition with soybean growers.

The increased demand for vegetable oil reflects the increased consumption of margarine, shortening, and cooking and salad oils. Use of soybean and cottonseed oils in the manufacture of margarine rose from 203 million pounds in 1940 to 1,024 million pounds in 1955. Use of soybean oil alone increased from 87 million to 746 million pounds. Use of these oils in shortening increased from 1,035 million to 1,369 million pounds.

Changes also took place in the returns to growers for the oil in the oilseeds they sold, in the cost of the oil to the consumer in the form of margarine and shortening, and in the price spread or difference between the two. Between 1940 and 1955 the farm-to-retail spread for soybean and cottonseed oils used in margarine and shortening increased by about 70 percent, which was less than the average increase for all foods. The farmer's share of the consumer's dollar spent for margarine and shortening increased between 1940 and 1955 from about 19 percent to about 30 percent.

The margin for soybean and cottonseed oil is not precisely comparable with the margin for most other foods, because it includes margins for more processing than most foods require. Also, it is not a margin between quoted (or quotable) prices. It is the difference between the imputed value of oil in the farmers' soybeans or cottonseed and the imputed value of oil in the margarine or shortening bought by consumers at retail.

In 1940, both the payment that farmers realized for a pound of oil in soybeans or cottonseed and the ratio of that payment to the amount that consumers paid for the same oil in margarine and shortening were less than in any later year here studied. Just before World War II the farm value of oil rose more than the price of the oil products bought by consumers, and as a consequence the farmer's share increased. During the war, marketing charges were held nearly constant by price controls and such programs as the processors' subsidy for soybeans.

When wartime controls were removed in the fall of 1946, prices of fats and oils increased rapidly, and marketing charges increased correspondingly. Although prices for oil soon fell below these new levels, they began to rise again when the advent of trouble in Korea raised the general level of all prices.

From 1950 to 1955 farmers' returns for a pound of either of the two oils, but especially cottonseed oil, fell away significantly from the general price level. Soybean oil generally has given the farmer a better return per pound than cottonseed oil, although it has tended to cost the final consumer slightly less. Milling cottonseed is more complicated and at present more expensive than milling soybeans.

Marketing margins for the 1950 crop were at the highest level of the 4 years studied and retail prices were also highest at that time, but the percentage of the consumer's dollar taken by marketing costs was lowest. In periods of increasing prices, marketing charges have lagged behind farm prices; with decreasing prices, marketing charges have tended to remain relatively firm.

By 1955, however, marketing margins had fallen substantially below the high postwar level. Members of the oilseed processing industries at times said that their gross margins had disappeared entirely. Nevertheless, the vegetable oil industry has had some indirect benefits. By integrating oilseed processing with one or more subsequent operations, including feed mixing, oil refining, and manufacture and distribution of margarine and shortening, management has reduced or avoided certain costs. However, integrated plants cannot eliminate any essential steps or services. Whether or not an abnormally large proportion of the oilseed processors were marginal or submarginal during the period is not known. Some of the firms were expanding, modernizing, or building new plants.

Farmers' returns and marketing margins have varied little geographically, beyond regular (constant) differentials due to such items as transportation.

Month-to-month changes, especially for soybean oil, have varied considerably between years.

Marketing margins have averaged slightly more for margarine than for shortening, for several reasons. The value of the oil in shortening is almost 100 percent of the value of the shortening, whereas margarine contains 80 percent of oil and 20 percent of other ingredients that are proportionally less expensive. Also, the manufacturing process for shortening is simpler than that for margarine, being little more than refining, mixing, and homogenizing. The difference in costs is necessarily carried over into consumers' prices, as farmers receive the same return per pound for the oil in both products.

BACKGROUND

Two major phases of soybean and cottonseed oil marketing are considered in this study: (1) The marketing margin, or price spread, and (2) marketing practices and costs. The marketing margin, or price spread, is the difference between the payment farmers receive for a unit of oil in their oilseed and the cost of the same unit of oil to consumers. It includes all of the charges made by marketing agencies for the services they perform in converting the oilseed into oil and the oil into consumer products, and the cost of distributing these products to consumers in retail stores.

The price which consumers must pay for soybean and cottonseed oil in the margarine or shortening that they buy and the payment that farmers receive for the raw product do not always move up and down together.

Fluctuations of prices paid by consumers for food and of prices received by farmers for the raw product cause the margin received by marketing agencies to widen at one time and narrow at another. The margin may widen when farmers' receipts decline or consumers' costs increase, and narrow when the reverse occurs. Farmers expect consumers' costs to go down when farmers' returns fall, and consumers frequently blame farmers for high costs for food. Farmers, marketing agencies, and consumers need to understand the changes that occur in farmers' returns, marketing charges, and consumers' costs.

Many services must be performed along the marketing channel to change the farmers' seed into margarine or shortening and to deliver manufactured products to the consumers. Country elevators buy most of the farmers' soybeans, which they store until a mill buys the beans for processing into oil and meal. From the mill the oil is shipped to a refinery, where foreign material, free fatty acids, odor, and color are removed to prepare the oil for use as food. The oil moves from the refinery to a manufacturing plant, to be converted into consumer products. Cottonseed and cottonseed oil go through much the same processes as soybeans and soybean oil. After the two oils have been refined they are combined in the manufacture of margarine and shortening, which is a fairly simple mixing and packaging process. The manufacturer then distributes the finished products to retail outlets, either directly or through a wholesale distributor.

Many variations in this pattern occur in actual practice. The two oils originate in different areas and move in opposite directions. The processing of the seed and oil and the manufacture of consumers' products may be completed at a single location, or the oil may move a thousand miles from the mill to the refinery or to the manufacturing plant. Most mills are located in oilseed producing areas, and most refineries are located near margarine and shortening manufacturing plants.

Manufacturing plants for vegetable oil products are generally located in areas where consumption is high. Establishments are often large, and several companies may be located in a single area from which their products can be distributed efficiently.

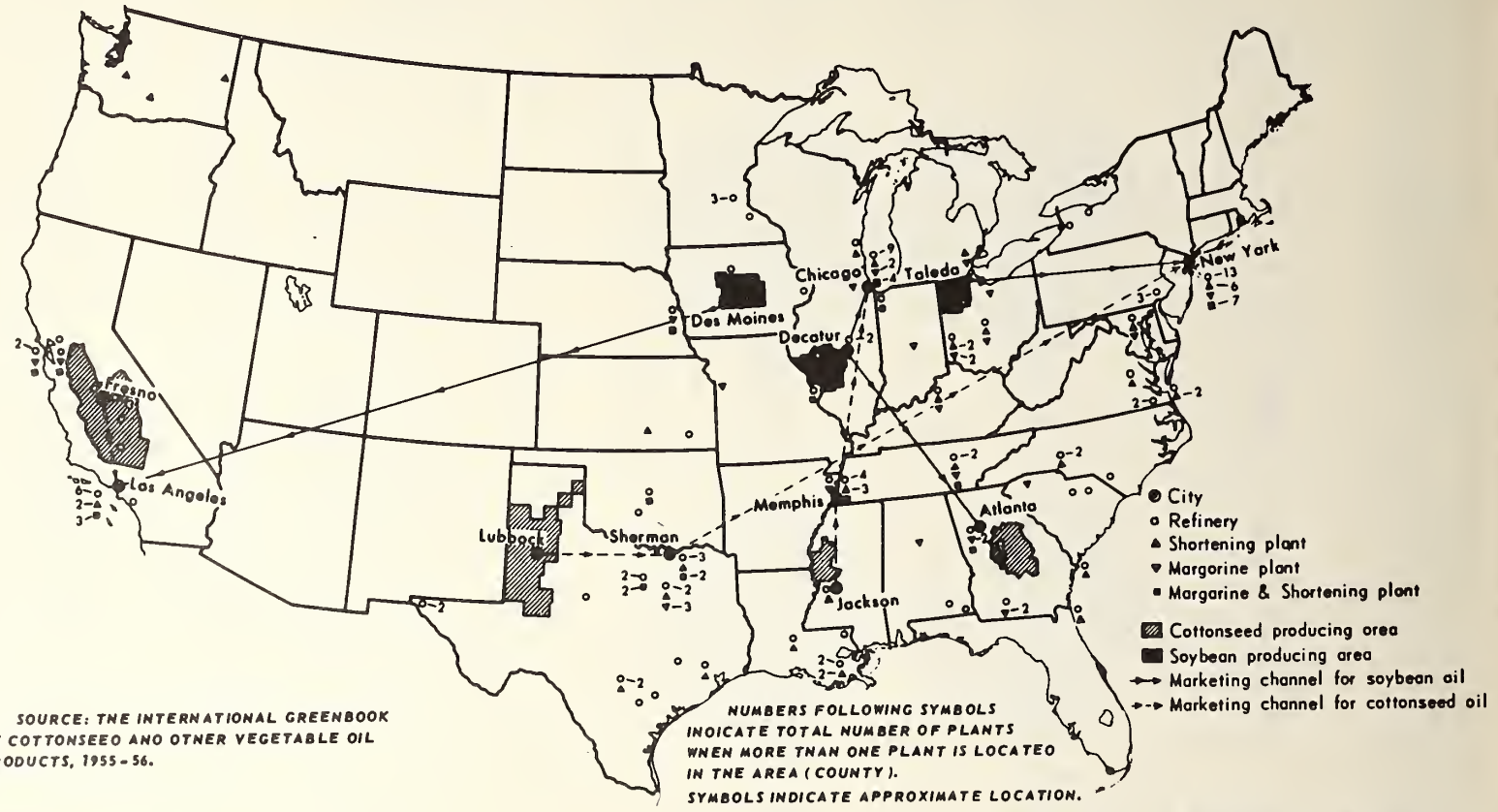
The choice of sources, channels, and destinations to illustrate the marketing process for these crops is somewhat arbitrary because the branches and reunions of the channels, and the directions of the movements, are numerous. By the study of receipts, stocks, processing, and interstate movements, it is possible, however, to select major channels of movement for oilseeds, oils, and consumers' products from which to draw conclusions. In this study, marketing charges have been measured for oil derived from soybeans and cottonseed of specific origins and consumed in specific cities (fig. 1).

Marketing margins for the 2 oils are shown separately because the 2 oilseeds are mostly produced by different farmers and in separate regions. In practice, neither margarine nor shortening is produced wholly from either of the 2 oils. These products usually contain both oils, the proportions used depending upon regional custom, prices, freight costs, and technical processes.

The first step in the selection of sources, marketing channels, and consuming markets to illustrate the movement of soybean and cottonseed oil from farmers to consumers was the choice of representative consuming centers. The major factors affecting this choice were regional representation, location within well-developed supply areas, and availability of adequate economic data. New York City, Atlanta, Chicago, and Los Angeles were selected because they are centers of oil refining and shortening and margarine manufacturing, as shown by the map. Choice of areas as sources of crude oil supplies for refining and manufacture into margarine and shortening was based on the rail movement of oil into the consuming centers as reported by the Interstate Commerce Commission. Cottonseed oil moving from Lubbock, Tex., to New York might be expected to be semirefined in Sherman, Tex., and that going to Chicago from Jackson, Miss., might be semirefined in Memphis, Tenn. We have assumed that cottonseed oil consumed in Atlanta is milled in Atlanta, and that oil consumed in Los Angeles is milled in Fresno. The sources of crude cottonseed oil--Lubbock, Atlanta, Jackson, and Fresno--are located in or near crop reporting districts Texas #1, Georgia #5, Mississippi #4, and California #5a, respectively. These districts are major cotton producing areas. Soybean oil milling centers selected were Toledo for New York City; Decatur, Ill., for Chicago and Atlanta; and Des Moines for Los Angeles. They are located in or near crop reporting districts Ohio #1, Illinois #4a, and Iowa #5, which are leading soybean producing areas.

OILSEED PRODUCING AREAS AND MARKETING CHANNELS

For Oil in Margarine and Shortening Used in New York City, Atlanta, Chicago, and Los Angeles



SOURCE: THE INTERNATIONAL GREENBOOK OF COTTONSEED AND OTHER VEGETABLE OIL PRODUCTS, 1955-56.

NUMBERS FOLLOWING SYMBOLS INDICATE TOTAL NUMBER OF PLANTS WHEN MORE THAN ONE PLANT IS LOCATED IN THE AREA (COUNTY). SYMBOLS INDICATE APPROXIMATE LOCATION.

U. S. DEPARTMENT OF AGRICULTURE

NEG. 4895-58 (2) AGRICULTURAL MARKETING SERVICE

Figure 1

To measure the marketing charges against the soybean and cottonseed oil embodied in margarine and shortening, values attributable to oil must be imputed for each of the two oilseeds for successive steps in the marketing process for the cities and seasons studied. In order to compute such values it was necessary to select a common basis. 1/

Soybeans and cottonseed are sold in different units (soybeans, bushels; cottonseed, tons) and yield oil at different rates (soybeans, 18.2 percent; cottonseed, 16.5 percent in recent years). Refining losses also vary between the oils. It is only when the 2 oils are refined that we have a truly comparable unit of measure and consequently a comparable price. It is as refined oil that the 2 oilseeds indirectly compete for the consumer's dollar. Prices of the 2 consumers' products, margarine and shortening, also are not directly comparable, since margarine is 80 percent oil and shortening is practically 100 percent oil. Relating these oilseeds and their products to a basis of refined oil makes comparisons possible throughout the marketing channel.

To convert market prices for oilseed, oils, and consumers' products to the equivalent of the price of a pound of refined oil requires numerous calculations to adjust the many differences between them.

The value of the oil in a bushel of soybeans is imputed by dividing the price that farmers receive for soybeans into 2 parts, 1 for oil and 1 for meal. The ratio of the oil portion to the meal portion is the same as the ratio of the market value of the oil to the market value of the meal. To derive the value of 1 pound of oil in soybeans, the value of the oil in a bushel is divided by the number of pounds of oil obtained from a bushel of soybeans. To put this oil value on a refined basis, a comparable adjustment is made for the refining loss.

For example, if the value of the oil produced from a bushel of soybeans is equal to approximately 47 percent of the value of both the oil and the meal at the mill, farmers receiving $2.08 per bushel for soybeans should attribute 47 percent of the value, or $0.98, to oil. If soybeans yield 10.6 pounds of oil per bushel, the farm value of crude oil would be 9.2 cents per pound. It requires 104 pounds of crude soybean oil to produce 100 pounds of refined oil, which is valued at 9.6 cents. The 4 pounds of oil lost in refining become vegetable oil foots, and have a small market value. Assuming the value of the refined oil to equal approximately 99 percent of the value of the refined oil plus the foots, the farm value of refined oil equals 9.5 cents per pound (November 1955, New York). In a parallel fashion, the value of a pound of oil in a consumer's product--margarine or shortening--is imputed from the value of individual ingredients, the weight of the oil in the product, and the price of the product.

Shortening is practically 100 percent oil, but margarine contains 20 percent of other ingredients. The most important ingredient--milk--accounts for about 16 percent of margarine by weight (fluid basis, or 1.6 percent solids, and

1/ "Imputed value" of oil as used in this study is the estimated value of the oil on a refined basis.

14.4 percent moisture). Other ingredients are salt, flavor, color, vitamins, antioxidants, and emulsifiers. The total cost of the oil usually averages between 94 and 97 percent of the cost of all ingredients in margarine (fig. 2).

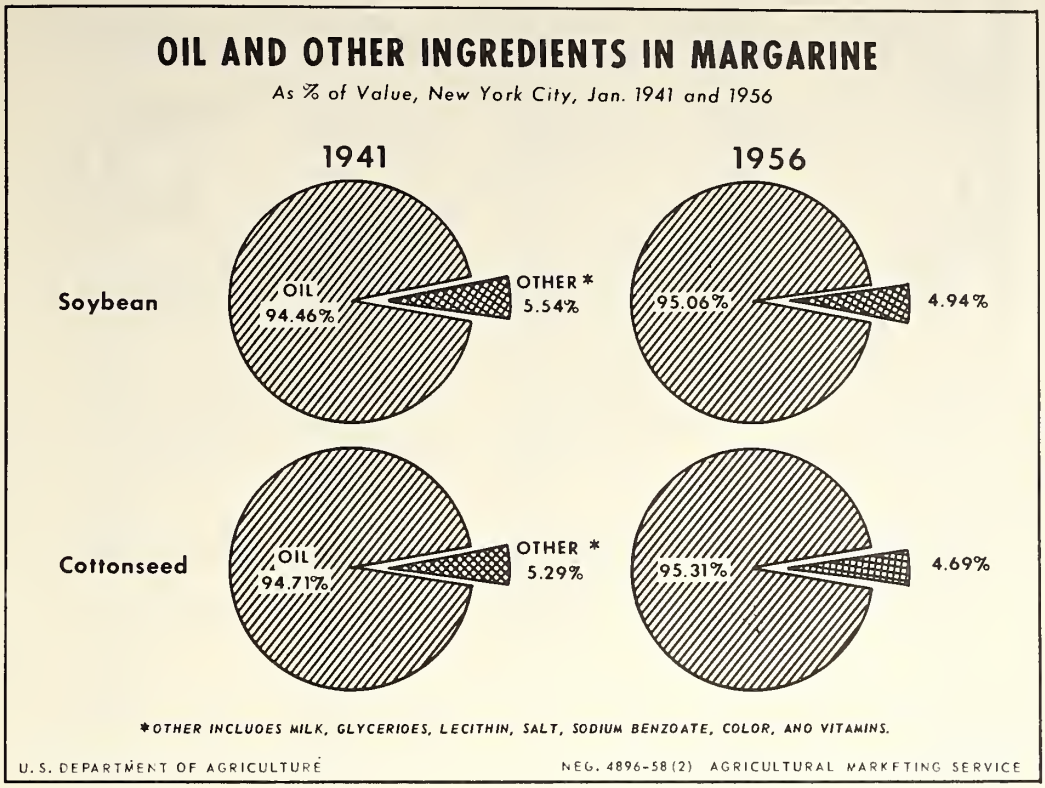


Figure 2

Assuming the value of the oil in margarine to be 95 percent of the value of all ingredients, it follows that the value of oil in a pound of margarine retailing at 31.3 cents per pound is 29.7 cents. Since the oil content of margarine is 80 percent, 1 pound of refined oil in margarine has a value of 37.2 cents. Shortening does not require this adjustment in price.

Prices of cottonseed, cottonseed oil, and cottonseed oil products are converted to a refined oil basis in the same manner as prices of soybeans.

The data presented here are not quoted prices for a bushel of soybeans or a pound of margarine, but the imputed value of a pound of refined oil at each step in the marketing channel, beginning with the oil share in the price farmers received for soybeans and cottonseed and ending with the oil share in the retail price of margarine and shortening in each of the 4 cities. In table 1 these imputed values are shown for both oils for November and January of 4 crop years. For example, in November 1940 the farmer received 3.75 cents per pound of oil (refined basis) in the soybeans which he sold to the country elevator, the miller received 4.50 cents per pound of oil (refined basis)

Table 1.--Value and farmer's share in the value of 100 pounds of refined soybean and cottonseed oil in the oilseeds and their products at important steps in processing and distribution for selected cities, November and January, 1940-41, 1945-46, 1950-51, and 1955-56

City and product	Soybean oil, November								Cottonseed oil, November							
	1940		1945		1950		1955		1940		1945		1950		1955	
	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share
	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.
New York City:																
Soybeans	3.75	100.0	11.52	100.0	14.25	100.0	9.47	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.11	100.0	9.81	100.0	16.67	100.0	7.39	100.0
Crude oil	4.50	83.4	12.32	93.5	17.97	79.3	11.56	81.9	4.81	64.7	13.34	73.5	21.73	76.7	11.36	65.0
Refined oil	5.18	72.4	13.13	87.7	19.38	73.5	13.38	70.8	5.70	54.6	14.31	68.5	23.27	71.6	13.20	56.0
Hydrogenated oil	6.05	62.0	14.35	80.2	21.60	66.0	15.40	61.5	6.60	47.2	15.42	63.6	25.73	64.8	15.72	47.0
Margarine--retail	19.70	19.0	27.99	41.1	41.98	33.9	37.17	25.5	19.81	15.7	28.08	34.9	42.20	39.5	37.24	19.8
Shortening--retail	18.42	20.4	24.87	46.3	35.24	40.4	34.70	27.3	18.42	16.9	24.87	39.4	35.24	47.3	34.70	21.3
Chicago:																
Soybeans	3.71	100.0	11.85	100.0	15.19	100.0	10.43	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.38	100.0	10.10	100.0	15.11	100.0	7.88	100.0
Crude oil	4.33	85.8	12.22	97.0	17.77	85.5	11.33	92.1	4.98	67.9	13.48	74.9	22.46	67.3	11.35	69.4
Refined oil	4.81	77.2	12.77	92.8	18.73	81.1	12.63	82.6	5.67	59.6	14.24	70.9	23.32	64.8	12.90	61.1
Hydrogenated oil	5.68	65.4	13.99	84.7	20.95	72.5	14.64	71.2	6.57	51.4	15.35	65.8	25.60	59.0	15.42	51.1
Margarine--retail	18.82	19.7	28.94	41.0	38.42	39.5	33.08	31.5	18.99	17.8	29.05	34.8	38.66	39.1	33.17	23.8
Shortening--retail	19.92	18.6	25.63	46.2	35.64	42.6	34.30	30.4	19.92	17.0	25.63	39.4	35.64	42.4	34.30	23.0
Atlanta:																
Soybeans	3.56	100.0	11.83	100.0	15.91	100.0	10.46	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.25	100.0	10.06	100.0	14.78	100.0	7.02	100.0
Crude oil	4.36	81.7	12.20	97.0	17.74	89.7	11.30	92.5	5.00	65.0	13.51	74.4	22.51	65.7	11.39	61.7
Refined oil	5.11	69.7	13.07	90.5	19.24	82.7	13.22	79.1	5.16	63.0	13.98	71.9	22.78	64.9	12.20	57.6
Hydrogenated oil	5.98	59.6	14.29	82.8	21.46	74.1	15.24	68.7	6.06	53.6	15.09	66.7	25.12	58.9	14.71	47.7
Margarine--retail	15.93	22.4	29.19	40.5	36.30	43.8	29.19	35.8	15.94	20.4	29.25	34.4	36.49	40.5	29.14	24.1
Shortening--retail	19.12	18.6	24.52	48.3	34.63	45.9	35.00	29.9	19.12	17.0	24.52	41.0	34.63	42.7	35.00	20.1
Los Angeles:																
Soybeans	3.27	100.0	11.68	100.0	14.00	100.0	9.05	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.31	100.0	9.31	100.0	17.12	100.0	6.28	100.0
Crude oil	4.27	76.5	12.23	95.5	17.68	79.2	11.18	80.9	4.96	66.6	14.44	64.5	20.76	82.5	11.64	54.0
Refined oil	5.54	59.0	13.49	86.6	20.12	69.6	13.73	65.9	5.55	59.6	14.56	64.0	20.94	81.8	12.41	50.6
Hydrogenated oil	6.41	51.0	14.72	79.4	22.34	62.7	15.75	57.5	6.45	51.3	15.67	59.4	23.21	73.8	14.92	42.1
Margarine--retail	17.43	18.8	29.60	39.4	38.60	36.3	33.42	27.1	17.44	19.0	29.67	31.4	38.71	44.2	33.32	18.8
Shortening--retail	17.32	18.9	24.22	48.3	33.83	41.4	35.10	25.8	17.32	19.1	24.22	38.4	33.83	50.6	35.10	17.9

Continued -

City and product	Soybean oil, January								Cottonseed oil, January							
	1941		1946 1/		1951		1956		1941		1946 1/		1951		1956	
	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share
	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.
New York City:																
Soybeans	4.41	100.0	11.79	100.0	17.66	100.0	10.34	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.53	100.0	9.69	100.0	17.63	100.0	8.46	100.0
Crude oil	5.44	81.0	12.38	95.2	21.57	81.9	12.25	84.4	5.52	63.9	13.41	72.2	24.86	70.9	13.05	64.8
Refined oil	6.08	72.5	13.13	89.8	23.30	75.8	13.97	74.0	6.40	55.1	14.31	67.7	25.97	67.9	14.40	58.8
Hydrogenated oil	6.95	63.4	14.35	82.1	25.53	69.2	15.99	64.7	7.30	48.4	15.42	62.9	28.25	62.4	16.92	50.0
Margarine--retail	18.31	24.1	28.70	41.1	2/46.91	37.6	36.14	28.6	18.49	19.1	28.78	33.7	2/47.04	37.5	36.25	23.3
Shortening--retail	18.42	23.9	25.33	46.5	40.44	43.7	34.80	29.7	18.42	19.2	25.33	38.3	40.44	43.6	34.80	24.3
Chicago:																
Soybeans	4.56	100.0	11.95	100.0	18.03	100.0	11.10	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.76	100.0	10.28	100.0	16.85	100.0	8.31	100.0
Crude oil	5.32	85.7	12.29	97.2	21.37	84.4	12.02	92.3	5.64	66.7	13.55	75.9	25.72	65.5	13.06	63.6
Refined oil	5.71	79.9	12.77	93.6	22.65	79.6	13.22	84.0	6.37	59.1	14.24	72.2	25.72	65.5	14.10	58.9
Hydrogenated oil	6.58	69.4	13.99	85.4	24.88	72.5	15.24	72.9	7.27	51.8	15.35	67.0	28.00	60.2	16.62	50.0
Margarine--retail	19.34	23.6	26.88	44.5	2/43.13	41.8	33.24	33.4	19.44	19.4	26.99	38.1	2/43.31	38.9	33.14	25.1
Shortening--retail	19.92	22.9	24.82	48.2	38.44	46.9	34.50	32.2	19.92	18.9	24.82	41.4	38.44	43.8	34.50	24.1
Atlanta:																
Soybeans	4.59	100.0	11.93	100.0	18.00	100.0	11.08	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	4.11	100.0	9.70	100.0	17.31	100.0	7.50	100.0
Crude oil	5.30	86.6	12.27	97.2	21.33	84.4	12.00	92.3	5.66	72.6	13.59	71.4	25.77	67.2	13.13	57.1
Refined oil	6.01	76.3	13.07	91.3	23.16	77.7	13.81	80.2	5.86	70.2	13.98	69.4	25.12	68.9	13.35	56.2
Hydrogenated oil	6.88	66.7	14.29	83.5	25.38	70.9	15.83	70.0	6.76	60.9	15.09	64.3	27.82	62.2	15.87	47.3
Margarine--retail	15.34	29.9	30.0	39.8	39.78	45.2	29.13	38.0	15.45	26.6	30.07	32.3	39.86	43.4	29.13	25.8
Shortening--retail	19.02	24.1	24.62	48.5	37.54	48.0	34.70	31.9	19.02	21.6	24.62	39.4	37.54	46.1	34.70	21.6
Los Angeles:																
Soybeans	3.97	100.0	11.88	100.0	17.32	100.0	10.08	100.0	---	---	---	---	---	---	---	---
Cottonseed	---	---	---	---	---	---	---	---	3.58	100.0	10.16	100.0	18.21	100.0	7.21	100.0
Crude oil	5.21	76.1	12.29	96.6	21.29	81.4	12.02	83.9	6.04	59.3	14.51	70.0	24.16	75.4	12.10	59.6
Refined oil	6.44	61.6	13.49	88.1	23.60	73.4	14.32	70.4	6.32	56.6	14.56	69.8	25.25	72.1	12.47	57.8
Hydrogenated oil	7.31	54.3	14.72	80.7	25.83	67.1	16.34	61.7	7.15	50.1	15.68	64.8	27.53	66.2	14.98	48.1
Margarine--retail	17.67	22.5	28.78	41.3	43.47	39.9	31.52	32.0	17.66	20.3	28.85	35.2	43.54	41.8	31.37	23.0
Shortening--retail	17.32	22.9	24.22	49.0	38.54	45.0	35.50	28.4	17.32	20.7	24.22	41.9	38.54	47.3	35.50	20.3

1/ A subsidy of 20 cents per bushel was allowed processors of soybean oil, to permit acceptable margins without increasing ceiling prices on consumer products or decreasing the support price on farm production.

2/ As yellow margarine was not allowed to be sold in Chicago and New York at this time, prices for white margarine have been adjusted to put all four cities on the same basis (see page 46).

Note: The value of oil in 100 pounds of margarine may be estimated by multiplying each oil value in this table by the conversion factor 80 percent.

which he delivered to the refinery, and the consumer paid 19.70 and 18.72 cents per pound of oil (refined basis) contained in the margarine or in the shortening which he purchased. Any oil value in table 1 may be compared with any other oil value in different areas, at different steps in the marketing channel, and at different times.

Parallel to these dollars-and-cents values, the farmer's share is shown as a percentage of the value of oil at each step in the marketing channel. The two types of data require joint study to relate the farmer's position to changing oil values.

Changes in marketing services such as better packaging, increased nutritional values, and refrigeration, and changes in marketing costs such as increased wages, taxes, and transportation, all affect the charges made by marketing agencies. Relating changing services and costs to margins points out to farmers the effect of these factors on their income, and to consumers the effect on their food costs.

Data available permit the estimation of reliable average farm values and total marketing charges for oil, but not the distribution of marketing charges among the segments of the industry as the oil proceeds along the marketing channel. Some reasonable estimates of charges made for milling the oilseeds, refining and hydrogenating the oil, and manufacturing consumer products are possible, but the data come from various sources and the estimates are not always suitable for direct comparison with margin information. It is hoped that in the future more detailed studies of cost factors that affect the marketing margin may be made. Information on marketing practices and costs of manufacture and distribution may help to explain the wide variations in consumers' cost between brands of margarine and shortening, and the lack of variation in the cost of ingredients.

OIL VALUES AND MARKETING MARGINS

Farm Values for Soybean and Cottonseed Oil

A larger part of the consumer's dollar went for marketing charges in 1940-41 than in any later year studied. At that time farmers averaged about 21 percent of the consumer's purchase cost for soybean and cottonseed oil. 2/ Oil in margarine returned the largest share of the consumer's dollar to farmers in 1950-51, when they received an average of 40 percent and marketing, processing, and distribution costs took 60 percent. By 1955-56 the farmer's share for both oils had fallen by more than 10 percent. Soybean farmers received roughly $75,000,000 from oil used in margarine in 1955-56, and in the same year the returns from shortening added up to $95,000,000. Returns to cottonseed producers were $21,000,000 and $33,000,000, respectively, from the same two products.

2/ The farmer's share of the consumer's dollar, as the term is used here, is the ratio of the value of the oil contained in soybeans or cottonseed which the farmer sells to the value of the oil when the consumer buys it in margarine or shortening.

Table 2 shows the farmer's share of the consumer's dollar spent for margarine and shortening sold in each of the 4 cities in this study. For soybean oil in margarine, the farmer's share fell from 41 percent in 1945 to 32 percent in 1955, mostly after 1950. For cottonseed oil, however, the farmer's return fell from 34 percent in 1945 to 23 percent in 1955, closely approaching the 1940 position.

Table 2.--Farmer's share of consumer's dollar paid for oil incorporated in margarine and shortening, by cities, 1940-41 to 1955-56 1/

Consuming center	Shortening				Margarine			
	Nov. 1940	Nov. 1945	Nov. 1950	Nov. 1955	Nov. 1940	Nov. 1945	Nov. 1950	Nov. 1955
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
New York City	19.48	45.06	42.15	25.81	17.86	38.96	35.90	23.51
Chicago	18.20	44.07	42.58	28.57	19.03	38.66	39.38	28.81
Atlanta	17.40	42.82	43.49	23.51	21.06	36.54	41.66	28.21
Los Angeles	19.04	40.88	48.30	20.68	18.89	34.20	41.45	21.73
Average 4 cities	18.53	43.21	44.13	34.64	19.21	37.09	39.60	25.56
	Jan. 1941	Jan. 1946	Jan. 1951	Jan. 1956	Jan. 1941	Jan. 1946	Jan. 1951	Jan. 1956
New York City	22.73	44.47	43.65	28.39	22.32	38.48	37.59	26.77
Chicago	21.90	46.00	46.13	30.17	22.10	42.10	40.80	30.49
Atlanta	22.25	41.66	46.56	25.24	27.77	34.88	44.06	30.05
Los Angeles	28.31	43.71	46.68	23.15	21.04	37.33	41.14	26.15
Average 4 cities	23.80	43.96	45.76	26.74	23.31	38.20	40.90	28.36
Average 2 months	21.16	43.58	44.94	30.69	21.26	37.64	40.25	26.96

1/ As margarine and shortening are manufactured of a combination of soybean and cottonseed oil, the farmer's share of the consumer's dollar spent for oil in these 2 products lies between the shares for each oil calculated separately. These figures show average value for both oils in the customary proportion used in each product in the 4 centers.

These comparisons, perhaps, stand out more clearly when stated in dollars and cents. The farmer's return for cottonseed oil (used in margarine) rose from 3.26 cents per pound in November 1940 to 15.92 cents in November 1950, then fell back to 7.14 cents in November 1955. The situation shown for each succeeding January is approximately the same as that shown for each November (table 1).

From 1940 to 1955, yields per acre increased about a fourth for soybeans and about a third for cottonseed. The farmer's position was not improved to the extent indicated by these ratios, however, because the increased yields per acre were obtained at the cost of more fertilizer, better culture, and better seed.

Oilseed processors also increased their output of oil by obtaining more oil per unit of seed processed. Their processing costs increased during the period, partly as a result of shifting to more costly--and more efficient--equipment, which enabled them to obtain significantly larger amounts of oil.

From 1940 to 1950 the average yield of oil per bushel of soybeans processed in the United States increased by about 20 percent. The corresponding increase for cottonseed oil was roughly 6 percent. Increases in yields of soybean oil have been gradual and continuous since World War II. With continued and accelerated growth of the soybean crop from the early thirties, new milling capacity has been added year after year. Better facilities, particularly for solvent extraction of oil, have been adopted. Increased yields of oil per unit of seed, resulting from introduction of more productive varieties or improved extraction methods, obviously increase the quantity of oil produced per acre of oilseed harvested.

Cottonseed processing has a commercial history reaching back nearly a century, with little growth during the period here surveyed. For the most part the newer-type mills have been adopted only where (1) cotton growing has shifted to new localities and (2) increased concentration of cottonseed milling has justified the building of larger plants. Furthermore, cottonseed has proved far more resistant to newer processing methods and equipment than soybeans. As a result, the yield of cottonseed oil per ton of seed has shown most of its significant increase only since 1951. With both solvent and screw-press methods of extraction now showing great advances in yield over the existing hydraulic presses, the area of higher yields can be expected to expand, with consequent continued increase in average yield of oil per unit of oilseeds processed in the United States.

The advantage of the latest equipment is not, of course, spread over all plants in the industry for either oil. Size and location of plants and quality of management also influence output, with size perhaps having the greatest influence. 3/

The farmer's value of the oil contained in the soybeans and cottonseed which farmers sell is affected by the value of the byproducts of crushing and refining. From 18.0 to 18.5 percent of the weight of the soybeans sold by farmers is oil, and from 75 to 78 percent is meal. 4/ The average value of the oil is usually about 48 percent of the value of both products at the mill.

3/ Brewster, J. M. Comparative Economies of Different Types of Cottonseed Oil Mills and Their Effects on Oil Supplies, Prices, and Returns to Growers. U. S. Dept. Agr., Mktg. Res. Rpt. No. 54. 1954.

Spilsbury, C. C. Marketing and Processing Costs of Cottonseed-Oil Mills in the Postwar Period, 1946-47 to 1950-51. U. S. Dept. Agr., Prod. & Mktg. Admin. 1952. (Processed)

4/ Approximately 5.7 pounds of soybeans or 6.3 pounds of cottonseed are required to produce a pound of refined oil. These quantities vary from month to month and season to season.

When soybean oil and meal leave the mill they enter divergent channels for unrelated uses, each competing with various other products. A large crop of soybeans, other factors being equal, would result in a large production of both oil and meal and low prices for oil, meal, and beans. Since oil and meal are sold in separate markets, however, a shortage and hence a high price in one market might occur when there were adequate supplies, or even surpluses, in the other market, and in turn be accompanied by an average farm price for beans. The relation between the market value of soybeans and that of soybean products is illustrated in figure 3.

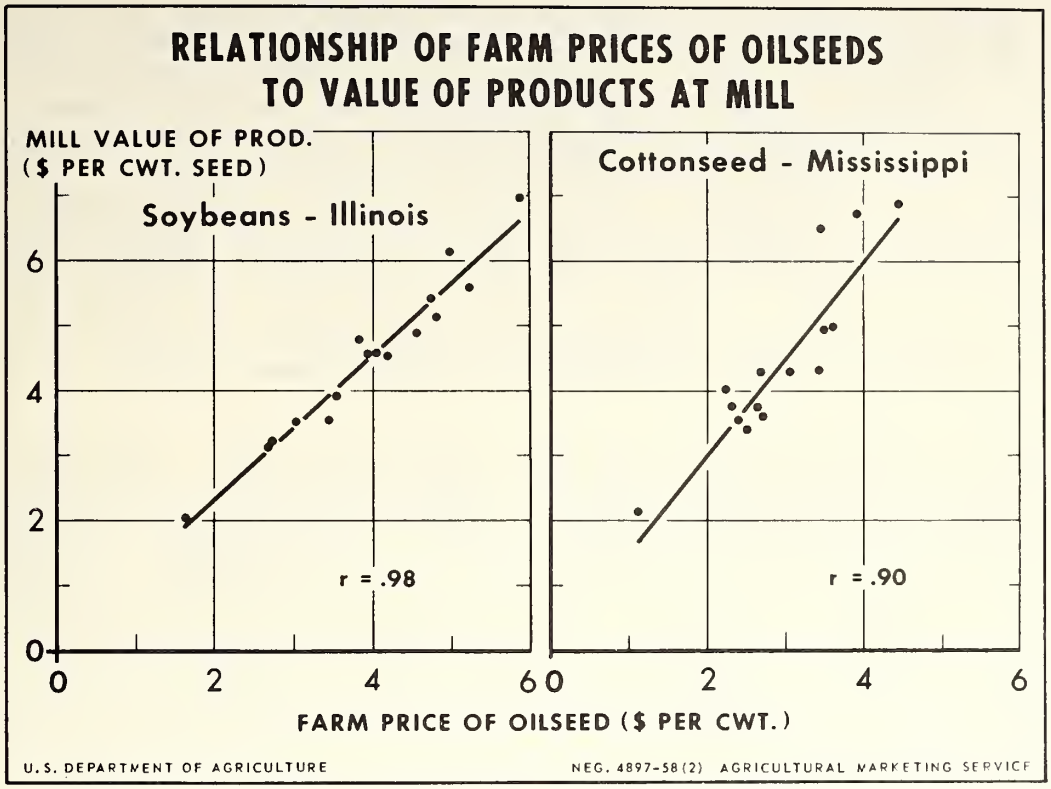


Figure 3

Cottonseed yields on an average about 16.5 percent of oil, 47 percent of meal, 9 percent of linters, and 22 percent of hulls. The value of the oil is usually slightly over 50 percent of the total value of the joint products, oil, meal, linters, and hulls. The combined value of these products is not as closely related to the price of cottonseed as the value of soybean products is to the price of soybeans (fig. 3). Different processing practices result in different product yields.

To produce 100 pounds of refined oil requires about 104 pounds of crude soybean oil or 106 pounds of crude cottonseed oil. The quantity lost in refining is principally recovered in the byproduct known as foots or soapstock. With extensive replacement of soap by synthetic detergents since the war,

however, the market for vegetable oil foots in the soap industry has likewise greatly declined. Some new demand has developed, however, in the feed mixing industry. The lower the return on foots, of course, the greater the share of the production costs that must be borne by the oil.

Oilseed yields and refining losses both affect marketing costs, and in turn influence farm values for the oil in the oilseed.

Oil Processing Margin

Even though data from which to compute the margin covering the milling, refining, and hydrogenation of oil are not complete, certain trends in this margin can be observed. Usually these services take a smaller part of the consumer's dollar than the farmer or the manufacturer and distributor take; however, the trend has been generally slightly upward during the period studied. The estimated gross margin for country elevators and soybean millers increased from about 0.9 cent per pound of oil in 1940 to about 3.3 cents in 1950, and then fell to about 1.5 cents in 1955. 5/ The cottonseed oil margin, which has been substantially above the soybean oil margin, increased from about 1.8 cents per pound of oil in 1940 to around 6.8 cents in 1950. The 1955 margin showed a decrease of about 2.1 cents per pound from 1950. Most of the fluctuation in these margins has been due to changes in the charges for extracting oil at the mill.

Numerous millers have complained that the margins do not cover their costs. Costs for individual millers vary widely. Figures collected by the Soybean Processors' Association from its members showed average costs for processing soybeans in 1952-53 to be 37 cents per bushel, or about 1.8 cents per pound of oil (refined basis) before allowing for a return on owned capital. 6/ The amount of owned capital per bushel of beans processed has not been estimated. In 1955-56, when the spread between the value of oil in soybeans and the value of oil at the mill averaged about 30 cents per bushel, it was less than this 1952-53 cost figure. Of course, quoted prices for oil and meal do not always show the true spread at a given time, especially under extensive integration. For example, meal prices--as quoted--often are supplemented by increases in margins from feed-mixing operations. In 1955, cottonseed oil margins averaged about $9.00 per ton above the estimated processors' cost of $20.36 per ton (3.1 cents per pound of oil) for 1950-51. 7/

5/ The difference between the farm value of oil and the value of oil at the mill covers the charges made by the country elevator and the oil mill for all of the services they perform in the marketing process.

6/ Spilsbury, C. C. Processing Costs of Soybean-Oil Mills, 1951-52 and 1952-53. U. S. Dept. Agr., Agr. Mktg. Serv. May 1954. (Processed)

7/ Spilsbury, C. C. Marketing and Processing Costs of Cottonseed-Oil Mills in the Postwar Period, 1946-47 to 1950-51. U. S. Dept. Agr., Prod. & Mktg. Admin. 1952. (Processed)

Industry integration makes margins data for intermediate steps in the marketing process both arbitrary and sparse. Integration of production or processing of oil with some other type of business, or vertical integration of several steps in production and processing, makes the assignment of costs an indeterminate and discretionary accounting procedure. Furthermore, such integrated operations account for so large a percentage of the total oils used in margarine and shortening that step-to-step prices representative of the industry are unavailable. Intermediate margins shown in this report, therefore, are largely estimated or approximated normals.

By 1952, margins unquestionably were declining from the high levels that followed removal of wartime controls. Furthermore, representatives of the vegetable oil industry have said that the high margins of 1946-50 were speculative rather than operating returns. The distinction is uncertain; its interpretation must depend upon the trading customs of the specific mill or the industry. For any normal period, composed of several years of fluctuating prices, costs, and margins, the least efficient members of a competitive industry must be expected to make no profit or to sustain a loss. It is impossible to learn from available data whether the soybean and cottonseed processing industries have been doing better or worse since World War II than this normal expectation.

Trends in the Overall Marketing Margin and Oil Values

Although the margins for single steps in the processing and marketing channel are hard to define, the overall margin between oil mill and consumer is reasonably clear. The overall marketing margin or price spread is the difference between the price that consumers pay for a pound of refined soybean or cottonseed oil in margarine or shortening and the payment farmers receive for the same oil in soybeans or cottonseed.

This margin represents the return to marketing agencies for all the services required in marketing from the time farmers sell the seed until the oil reaches the consumers as margarine or shortening. It includes such services as assembling, transportation, storage, milling, processing, manufacturing, packaging and distributing. Changes in the margin represent changes in the cost of marketing soybean and cottonseed oil as margarine or shortening. The season-to-season movements of the values of both oils in Chicago between 1940-41 and 1955-56 are presented in figure 4.

Farm oil values rose to a comparatively high level in 1946-47 and 1947-48, but they fell in 1948-49 and 1949-50 because of more plentiful oil supplies. Except for the brief rise during the Korean period, farm values of oil have changed little since World War II.

The increases in values of oil in 1950 and 1955 over values in 1940 throughout the marketing channel are given in table 3. The increases were proportionally less at each step as the oil progressed along the channel toward the consumer. For example, the farm value of cottonseed oil in November 1950

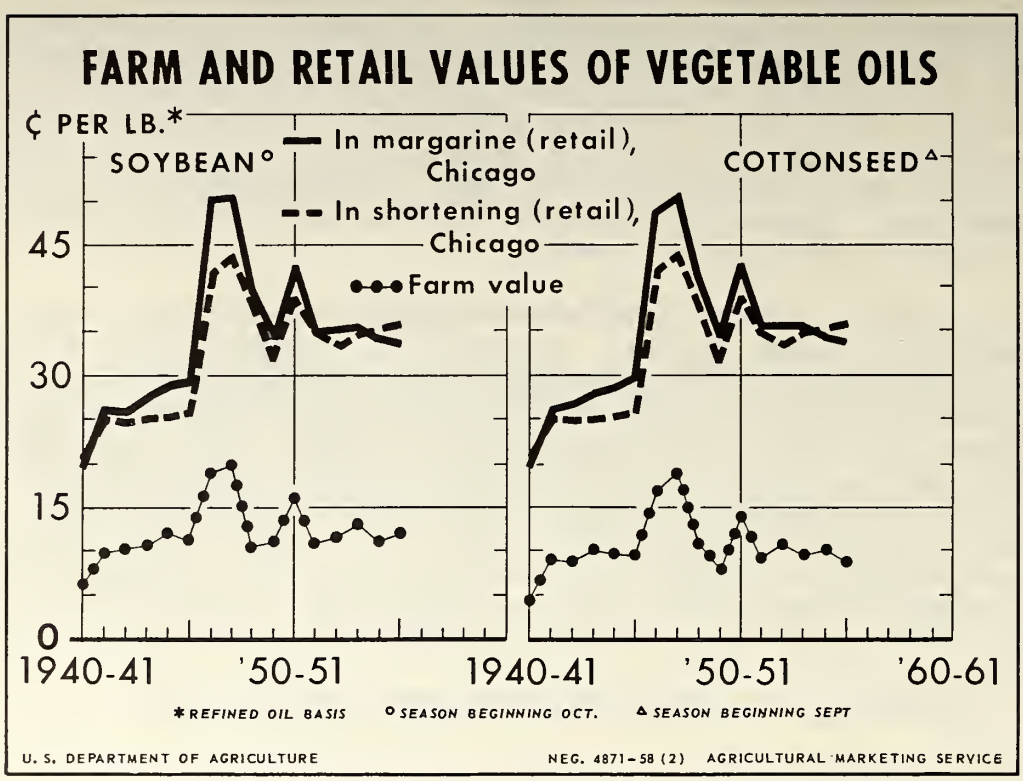


Figure 4

was 487 percent of the value in November 1940, and the relative values for oil at other steps along the channel are shown in the table. The greater flexibility of oil values at the farm level than at the consumer level is indicated by the table.

Differences Between Oilseeds

Marketing margins and farmers' returns show interesting differences between soybean oil and cottonseed oil. In most instances studied, the oil in soybeans returned more per pound to farmers than the oil in cottonseed, even though throughout the period soybean oil was discounted somewhat on the market. For the 4 November periods studied for selected oilseed sources and consumption centers, farmers realized about 10 cents per pound for soybean oil and about 9 cents for cottonseed oil. In the 4 succeeding Januaries the corresponding figures were 11.2 cents and 9.8 cents.

Cottonseed is a byproduct of cotton fiber, and there appears some reason to expect a byproduct to be handicapped in the market. Moreover, the farmer and ginner are sometimes said to assume that the cottonseed should be "responsible" for the cost of ginning the seed cotton. If a large share of the cost of

Table 3.--Index of the value of soybean and cottonseed oil in the oilseeds and their products at various steps in processing and distribution for 4 consuming centers, 1945-46, 1950-51, and 1955-56

(1940-41 = 100 percent)

Product	November 1945		November 1950		November 1955	
	Soybeans	Cottonseed	Soybeans	Cottonseed	Soybeans	Cottonseed
	Percent	Percent	Percent	Percent	Percent	Percent
Soybeans	328	---	415	---	276	---
Cottonseed	---	301	---	487	---	219
Crude oil	280	277	408	433	260	232
Refined oil	254	259	375	409	257	230
Hydrogenated oil	238	240	358	388	253	237
Margarine--retail	161	161	216	216	185	184
Shortening--retail	138	133	186	186	186	186
	January 1946		January 1951		January 1956	
Soybeans	272	---	405	---	243	---
Cottonseed	---	266	---	467	---	210
Crude oil	231	241	402	440	227	225
Refined oil	217	229	382	409	228	218
Hydrogenated oil	207	216	367	392	229	226
Margarine--retail	162	161	245	245	184	183
Shortening--retail	133	133	203	208	187	187

ginning is charged against the seed, obviously the net payment to the farmer might be low in relation to prices of the joint products and to the market value of vegetable oils. It was mentioned above that from 1950 to 1955 the farmer's share of the consumer's oil dollar declined further for cottonseed oil than for soybean oil.

Effect of Seasonal Movement of Oilseeds on Margins

Both oils show low farm values and high marketing margins during the harvest season. At this time cotton farmers dispose of their cottonseed as soon as it is ginned. Some soybean farmers have enough storage to hold a considerable part of their crop, but in general they, too, have to turn much of the crop into commercial channels at harvesttime. (Exceptions at times are the amounts of either seed that are included in Government programs.)

Seasonal variations in the marketing margin and in the returns that farmers receive from soybean and cottonseed oil have not been analyzed in detail for all years and all 4 geographical sources or consumption centers. Comparisons that have been made between cities indicate no great difference in the

seasonal margin or the farmers' returns. And there appears to be no logical reason to expect large differences. Even though not all soybean and cotton producing areas are in direct competition, the national market for their products contains numerous overlapping areas. As a result, seasonal increase or decrease in price is promptly transmitted from one area to another.

The data for oils consumed in Chicago have been studied in some detail, and the seasonal situation found there, while it does not represent a United States average, is assumed to be representative of conditions existing elsewhere.

Three lines in each chart of figures 5 and 6 represent the seasonal movements of the farm value of both oils and the corresponding changes in charges for marketing the oils as margarine and shortening. The 16-year simple average of monthly values is used to show the general direction of the fluctuation of these values during the season. Seasonal variation has been minimized to some extent by the inclusion of the seasons during World War II, when market prices were stabilized by price ceilings. The charts show that farm values tend to rise somewhat after the peak of the harvest sales and to fall again as harvest of the new crop approaches, and that marketing charges tend to move in directions opposite to those of farm values during a season. The monthly values for "high" and "low" seasons have also been plotted. These seasons were selected on the basis of the simple seasonal average of monthly values.

The character of the usual seasonal movements of farm values of oil and marketing margins for soybean and cottonseed oil in margarine and shortening at Chicago, and the effect of other factors on these movements, are illustrated in figures 5 and 6. The similarity of the movement between oil values is easily observable. Not quite so obvious is the greater variation and higher level of farm values for soybean oil compared with those for cottonseed oil. The marketing margins for margarine and shortening also show overall similarity of movement; however, margins for margarine vary more frequently and more widely between months than margins for shortening. Figures 5 and 6 show the effects of sudden shifts in economic factors on oil values and marketing charges. An example is the rise of oil values early in 1941 and the corresponding narrowing of the marketing margin for margarine.

From year to year, wide differences in seasonal price movement are to be expected, because of differences in the size of the crops, in the supply of competing fats and oils, in consumer demands, and in export and other programs. For this reason the analysis of the seasonal movements in single years has only a specialized application. Consequently, only the average of seasonal movements of price for the 16 crop years, 1940-41 through 1955-56, is discussed here.

Farm values and marketing margins for both soybean and cottonseed oil show definite seasonal movements which are similar for the 2 products. The 16-year average farm values of both oils start at their lowest points during the harvest season and rise gradually till spring. Cottonseed oil value moves more uniformly through the season. The low point for cottonseed oil occurs in early September at 0.8 cent, or about 9 percent, below the season's average; for soybean oil it occurs in early October at 1.3 cents, or about 11 percent, below

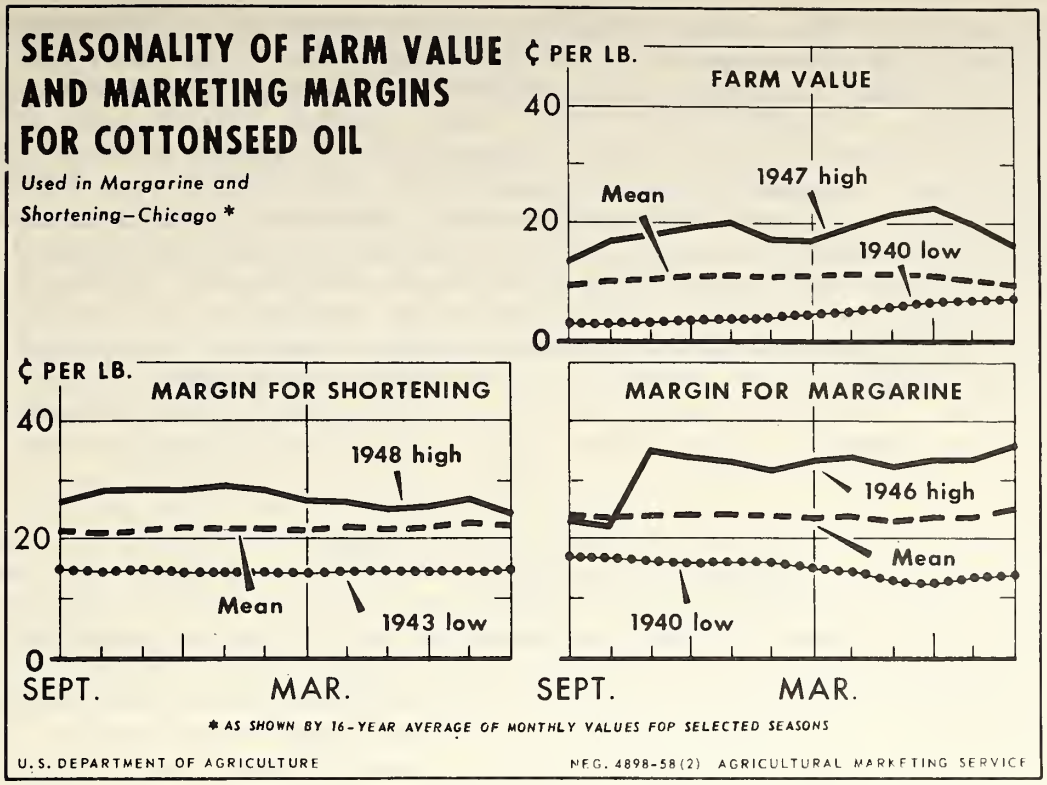


Figure 5

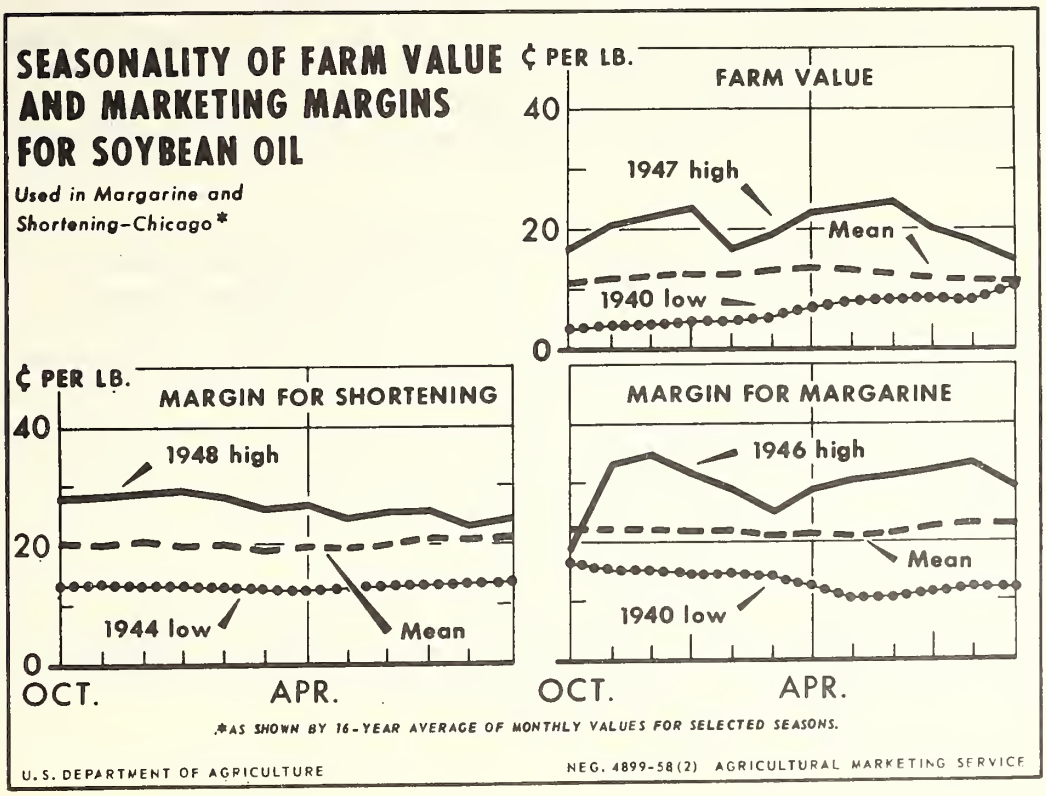


Figure 6

the season's average. The season's high is reached in early May by cottonseed oil, and in April by soybean oil. From these high points, farm value per pound of oil gradually declines again through the following harvest season.

Differences between the two oils in the seasonal movements of their farm value probably have numerous partial causes. Much of the difference, however, appears to be due to the ways they are marketed. Practically all cottonseed destined for processing is marketed directly from gin to mill, and within the short ginning season. In fact, informed opinion in the industry is that mills contract for the great bulk of the cottonseed crop, formally or informally, within about a fortnight in the early cotton-picking season. Furthermore, the milling season for many cottonseed oil mills is less than 6 months long. Thereafter, these short-season mills are out of the market. The last spurt of wide competition commonly occurs in May, when excess planting seed becomes available.

The market for soybeans is much more active through the season than the market for cottonseed. Soybeans follow diverse channels to market. In some recent years farmers have stored more than one-third of the crop for later sale. A quarterly check of soybean positions for several recent years indicates that during the first half of the marketing year, farmers and mills hold roughly equal amounts of soybeans, the two groups together accounting for perhaps three-fourths of the year's supply in the early part of the season. The remainder has been sold by farmers to elevators, warehousemen, grain dealers, exporters, or others, without resale to the mills.

Average seasonal movement for marketing margins is partly, but not wholly, the opposite of the movement of farm values of the oil. At any given price of oil, of course, if the marketing margin takes more the farmer takes less. The consumer's price of oil products varies somewhat, however, and the amount of the variation appears also in either the farm value of the oil or the marketing margin, or both.

Fluctuations in marketing margins appear to be more closely tied to consumers' price than to farmers' returns. The month-to-month movements of farm value and marketing margin for cottonseed oil were in the same direction 5 times during the average season, whereas the margin and consumers' cost per pound of oil moved together 6 times and in the opposite direction only twice. Of course, farm value of cottonseed oil reflects the fact that, in the 16 years studied, farmers sold the bulk of their cottonseed during September, October, and November. The average farm value per pound of oil in these 3 months for the 16-year period was 0.5 cent less per pound than the average of annual values.

The data for soybean oil suggest a somewhat different set of market relationships. Farmers' value of oil normally builds up from harvesttime till April, then declines continuously to the next harvesttime. The average value in April for the 16 years was 2.5 cents higher than in October, fluctuating around an average annual value of 12.2 cents.

In every month-to-month change in the average year, the farmers' value and the marketing margin moved in opposite directions. The months of maximum and minimum farm value corresponded with the months of minimum and maximum margins. Furthermore, consumers' cost moved with farmers' value and in opposition to the marketing margin 6 times; with the margin, and opposed to farmers' value, 5 times. As the farmers' value first dropped below its average in July, and continued to fall, the marketing margin rose to its high point. From June to September, farmers' value per pound of oil declined 2.2 cents, the marketing margin increased by 2.5 cents, and consumers' cost declined 0.3 cent. From September to October, however, farmers' value lost another 1.3 cents, the margin increased by 0.4 cent, and consumers' cost declined 1.2 cents. Average differences between individual months and their annual figures were 6.6 percent for farmers' values, 3.3 percent for margins, and 1.6 percent for consumers' costs.

A rather standard assumption regarding the marketing of crops with one yearly harvest period and year-round consumption is that, from harvesttime forward, costs and prices must rise to pay for carrying charges, including storage. For the 16 years here studied, this pattern of seasonal price movement does appear to predominate when the data are carefully analyzed. Measured from beginning to end of the marketing year, the farmers' value of cottonseed oil shows definitely more decreases than increases; that of soybean oil shows an equal number of increases and decreases. But measurements of farm values over the full 12 months introduce the influence of new crop prospects into each year.

Comparisons over 8 months, instead of 12 months, show 10 increases in farmers' value for cottonseed oil and 13 for soybean oil. (This supports the finding in 1951 that it would pay farmers to store soybeans for sale later in the season. 8/)

Results from such a comparison can be accepted only as a general indication. Any attempt to give a quantitative interpretation of the situation would require omission of the period of wartime controls and adjustment for Government programs, promotion of soybean exports by Government and industry, and other transitory influences (figs. 5 and 6).

In each of these measurements of marketing spread, the appropriate prices have been compared for the same month. This, however, is not the only way to measure marketing margins. The farm value of a commodity is determined to some extent by the buyer's expectations as to future developments. What the buyer considers the commodity worth will depend on (1) his own policies regarding inventories, hedging, and selling for later delivery, (2) his captive market through integrated enterprises, and (3) his internal management policy regarding volume, cost control, and continuity of operation. Practices vary widely among business firms, and from time to time in nearly every firm. The processors or handlers may have to look forward several months to estimate the

---

8/ Rollefson, A. M., Agnew, D. B., and Keirstead, C. H. Improving Soybean Marketing Through Farm Storage. U. S. Dept. Agr., Agr. Inf. Bul. No. 57. 1951.

return from each unit of raw material they buy today. This is perhaps especially true with oilseed millers, whose two principal products go into widely divergent markets.

For comparison with the cross-sectional, or simultaneous, method of measurement principally used in this report, lagged marketing margins for cottonseed and soybean oil used in margarine and shortening in Chicago in 1950-51 and 1954-55 have been computed. This computation compares the value of oil in oilseeds when sold by farmers with the value of the same oil when purchased some months later in consumers' products. Just as the geographic sources of oilseeds and the consuming centers considered here represent typical examples rather than an average of the whole industry, so, too, the specific periods (lags) assumed for the marketing, processing, and distribution following sales by farmers each month are based on typical cases rather than weighted averages for the whole crop.

The calculations assume that the first soybeans or cottonseed marketed will be the first processed, and maintain this assumption of "first in, first out" for the further steps in the marketing process. On the basis of this assumption the marketing process may require greatly varying periods of time, depending largely on the date on which the farmer sells the seed. Soybeans or cottonseed sold in early autumn may be processed immediately; beans or seed received in November, when storage facilities at the mill are nearly full, may be assumed to remain in storage for several months before being processed. The oil in cottonseed sold in November 1950 would, therefore, have required 262 days to reach the consumer in the form of margarine, while that in cottonseed sold in November 1954 would have required 290 days. Soybean oil would have moved more rapidly than cottonseed oil in both seasons. Comparisons can be made between other parts of the marketing season from figure 7.

Consumers' costs for the oils show a more consistent seasonal rise than farmers' values. For the 8-month comparison, soybean oil in consumers' products rose in 13 of the 16 years, and cottonseed oil rose in each of 10 years. This can be accepted as a normal expectation. As long as oilseeds or their products remain in industry's ownership, of course, they are building up carrying charges that in one way or another, according to this reasoning, will necessarily widen the marketing margin. This comparison suggests a tendency in the industry to arrive at retail prices by the lagged-margin process--by cumulating costs through the season rather than by simultaneous comparisons of prices.

If such costs are added as they accrue and are passed on to the consumer, then the margin will increase from month to month through the marketing season until the new crop begins to affect the market. To the extent that these costs accrue, the lagged margin, following an identical unit of product through the marketing channel, must be wider than the margin for any one day's prices (or imputed values). Also, the lagged margin will show any change in price that occurs during the marketing season, together with accumulating marketing costs, either adding to or reducing the accrued costs.

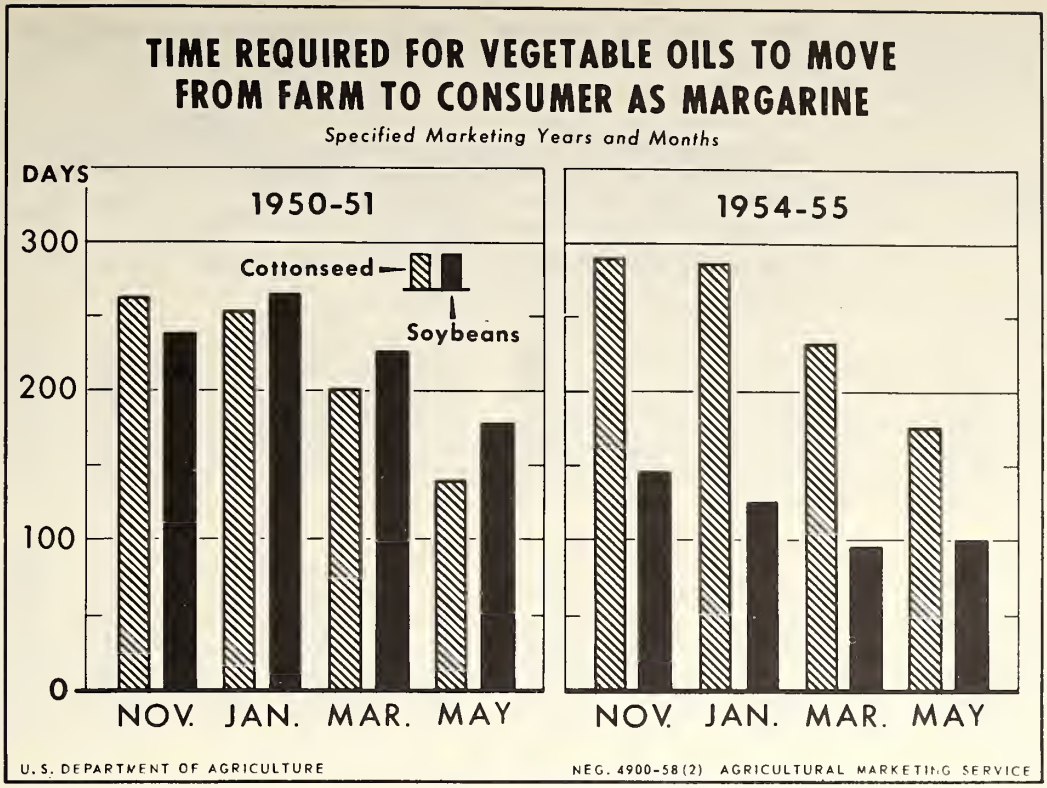


Figure 7

The effect of the change in general price level in 1946-47 is shown in the lagged margins for both soybean and cottonseed oil in margarine. Margins rose rapidly after the removal of price ceilings (table 4). A rise in price will appear as an unusual excess of the lagged margin over the simultaneous margin, unless through a futures market or other arrangement the effects of price changes are transferred from the industry to some other group.

Differences in Margins Between Areas

Geographically the data developed on marketing margins for soybean and cottonseed oil in margarine and shortening do not show great variation. Transportation costs vary, of course, but price differences appear to be held close to the minimum by competitive matching of oilseed sources with consumption areas for oil and meal. There obviously is some cross hauling of seed and of products; but it is probably held to a minimum because cross hauling and other unusual routings result in lower net margins to the processor, manufacturer, or distributor. Data from the oilseed and vegetable-oil industries seem adequate to show this, even though few of the pertinent series of prices are completely satisfactory when used alone. 9/

9/ Brewster, J. M. Comparative Economies of Different Types of Cottonseed Oil Mills and Their Effects on Oil Supplies, Prices, and Returns to Growers. U. S. Dept. Agr., Mktg. Res. Rpt. No. 54, p. 111. 1954.

Table 4.--Value and farmer's share in the value of 100 pounds of refined soybean and cottonseed oil in the oilseeds and their products at important steps in processing and distribution for Chicago, computed on a simultaneous and lagged basis, November, January, March, and May, 1950-51 and 1954-55

Date and product	Soybean oil				Cottonseed oil			
	Simultaneous		Lagged		Simultaneous		Lagged	
	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
November 1950:								
Soybeans	15.19	100.0	16.33	100.0	---	---	---	---
Cottonseed	---	---	---	---	15.11	100.0	15.40	100.0
Crude oil	17.77	85.5	21.25	76.8	22.46	67.3	25.15	61.2
Refined oil	18.73	81.1	22.75	71.8	23.32	64.8	26.05	59.1
Hydrogenated oil	20.95	72.5	19.15	85.3	25.60	59.0	18.85	81.7
Margarine--retail	38.42	39.5	39.15	41.7	38.66	39.1	39.39	39.1
Shortening--retail	35.64	42.6	36.84	44.3	35.64	42.4	36.84	41.8
January 1951:								
Soybeans	18.03	100.0	16.31	100.0	---	---	---	---
Cottonseed	---	---	---	---	16.85	100.0	14.51	100.0
Crude oil	21.37	84.4	17.06	95.6	25.72	65.5	15.70	92.4
Refined oil	22.65	79.6	17.73	92.0	25.72	65.5	16.58	87.5
Hydrogenated oil	24.88	72.5	19.64	83.0	28.00	60.2	19.04	76.2
Margarine--retail	43.13	41.8	39.13	41.7	43.31	38.9	39.25	37.0
Shortening--retail	38.44	46.9	36.44	44.8	38.44	43.8	36.44	39.8
March 1951:								
Soybeans	17.92	100.0	16.07	100.0	---	---	---	---
Cottonseed	---	---	---	---	16.87	100.0	16.65	100.0
Crude oil	21.12	84.8	15.92	100.9	25.20	66.9	16.54	100.7
Refined oil	22.75	78.8	17.42	92.3	26.15	64.5	17.37	95.9
Hydrogenated oil	24.98	71.8	18.55	86.6	28.68	58.8	19.04	87.4
Margarine--retail	44.59	40.2	39.00	41.2	44.75	37.7	39.14	42.5
Shortening--retail	41.04	43.7	36.24	44.3	41.04	41.1	36.44	45.7
May 1951:								
Soybeans	18.12	100.0	16.16	100.0	---	---	---	---
Cottonseed	---	---	---	---	15.12	100.0	15.01	100.0
Crude oil	19.86	91.2	15.72	102.8	23.53	64.3	16.37	91.7
Refined oil	22.75	79.6	17.42	92.8	24.68	61.3	17.37	86.4
Hydrogenated oil	24.98	72.6	18.55	87.1	26.96	56.1	19.04	78.8
Margarine--retail	45.29	40.0	38.36	42.1	45.39	33.3	39.06	38.4
Shortening--retail	41.64	43.5	36.24	44.6	41.64	36.3	36.44	41.2

Continued -

Table 4.--Value and farmer's share in the value of 100 pounds of refined soybean and cottonseed oil in the oilseeds and their products at important steps in processing and distribution for Chicago, computed on a simultaneous and lagged basis, November, January, March, and May, 1950-51 and 1954-55--Continued

Date and product	Soybean oil				Cottonseed oil			
	Simultaneous		Lagged		Simultaneous		Lagged	
	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share	Value	Farmer's share
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
November 1954:								
Soybeans	11.58	100.0	11.79	100.0	---	---	---	---
Cottonseed	---	---	---	---	10.28	100.0	11.99	100.0
Crude oil	12.64	91.6	12.62	93.4	13.23	77.7	14.93	80.3
Refined oil	13.96	82.9	13.94	84.6	14.60	70.4	14.60	82.1
Hydrogenated oil	15.98	72.5	15.52	76.0	17.12	60.1	16.32	73.5
Margarine--retail	33.82	34.2	34.90	33.8	33.93	30.3	34.35	34.9
Shortening--retail	35.64	32.5	34.53	34.1	35.64	28.9	34.23	35.0
January 1955:								
Soybeans	11.64	100.0	11.92	100.0	---	---	---	---
Cottonseed	---	---	---	---	10.40	100.0	11.21	100.0
Crude oil	12.60	92.4	12.17	97.9	13.47	77.2	12.88	87.0
Refined oil	14.02	83.0	13.50	88.3	14.80	70.3	13.10	85.6
Hydrogenated oil	16.04	72.6	15.36	77.6	17.32	60.1	15.72	71.3
Margarine--retail	35.01	33.2	32.59	36.6	35.13	29.6	34.63	32.4
Shortening--retail	35.74	32.6	34.63	34.4	35.74	29.1	33.93	33.0
March 1955:								
Soybeans	12.07	100.0	12.21	100.0	---	---	---	---
Cottonseed	---	---	---	---	10.80	100.0	10.84	100.0
Crude oil	12.29	98.2	12.08	101.1	13.43	80.4	11.73	92.4
Refined oil	13.50	89.4	13.34	91.5	14.50	74.5	13.10	82.7
Hydrogenated oil	15.52	77.8	15.82	77.2	17.02	63.5	15.72	69.0
Margarine--retail	34.90	34.6	33.11	36.9	35.05	30.8	33.21	32.6
Shortening--retail	35.54	34.0	35.04	34.8	35.53	30.4	33.93	32.0
May 1955:								
Soybeans	11.75	100.0	12.06	100.0	---	---	---	---
Cottonseed	---	---	---	---	10.33	100.0	9.92	100.0
Crude oil	12.61	93.2	13.02	92.6	14.48	71.4	11.75	84.4
Refined oil	13.80	85.2	14.32	84.2	15.30	67.5	13.10	75.7
Hydrogenated oil	15.82	74.3	15.40	78.3	17.82	58.0	15.72	63.1
Margarine--retail	32.64	36.0	34.25	35.2	32.85	31.4	33.21	29.9
Shortening--retail	34.53	34.0	34.23	35.2	34.53	29.9	33.93	29.2

Oilseeds and oils obviously are processed and stored at many geographic points, each undoubtedly having certain unique elements in its relationships to raw materials, to users of various types or qualities of products, and to competitive industry. Nevertheless, as comparative data indicate, competitive business management normally holds the many differentials to fairly constant values. Following any specific marketing channel, the oilseed products pass through points of direct competition--or a common market--so often that their values cannot drift far apart.

The average deviation from the mean value of refined soybean oil for the 4 cities and 4 months included in the report was less than 0.3 cent per pound; the maximum deviation was 0.8 cent per pound, in Los Angeles in November 1950. The average deviation for refined cottonseed oil was also about 0.3 cent per pound, and the maximum deviation was 1.6 cents per pound. Deviations were even smaller in January than in November.

Differences in Retail Values Between Cities

The values of oil in margarine in the 4 cities varied somewhat more from the mean than the values of refined oil, reaching about 4 cents per pound in Atlanta and New York City in November 1955. The average deviation for the 4 cities for the 4 years was about 1 cent. Average deviations in values of shortening closely approximated those in values of refined oil.

No adequate body of information is available for consumer products. Nearly all margarine and shortening is sold under brand names, and average values of oil in these consumer products varied less between cities than between brands. The prices commonly vary by several cents between brands, but only by a fraction of a cent between the oils used in their manufacture. From the factory through the wholesale steps in the distribution channel, prices are set in various ways, times, and places. Data on retail sales are available for practical use only as sampled by the Bureau of Labor Statistics. The sample retail prices are the material from which, in large degree, variations in total marketing margins must be measured.

The interrelations between consumption centers indicate both that the series are reasonably consistent with each other and that the geographical variations in costs and prices are small. In the 8 retail price series studied here, prices of oil in shortening in all 4 consumption centers and in margarine in 2 centers show the effects of these interrelations. Prices of oil in margarine in both New York City and Atlanta, however, show appreciable deviations from the more common trend, moving in opposite directions and reversing their own interrelationship between the prewar and postwar periods.

During most of 1940, the retail price of oil in margarine was about 3.5 cents per pound higher in New York than in Atlanta. This difference gradually decreased up to November 1942, when the average retail price in Atlanta rose above that in New York. Atlanta prices continued to rise to a maximum differential of 1.5 cents per pound in July 1944; they remained higher until December

1948, when New York prices again exceeded Atlanta prices. This later difference reached 6 cents per pound in 1952, and has remained about the same up to the present time. Differences in the market value of oil between New York and Atlanta were not large enough to explain the differences in value of oil in margarine between the two cities.

Information available suggests no economic cause for this divergence and reversal of relationship. The current level of Atlanta prices as reported to the Bureau of Labor Statistics shows a preference for lower-priced brands in the Atlanta market, perhaps because of the lower level of disposable income. In 1953 the per capita disposable income in Georgia was 72 percent of the United States average; in New York it was 117 percent. Low income, however, does not explain the reversal in price level that occurred early in the war and again following the 1948 harvest of oilseeds.

Price changes in Atlanta for oil in shortening follow closely the changes in New York. Atlanta consumers of vegetable shortening are currently buying the nationally advertised brands, which are usually higher priced than other brands. 10/

MARKETING PRACTICES AND COSTS FOR OILSEEDS AND THEIR PRODUCTS

Farm Practices and Costs

Soybeans and cottonseed are produced largely in different areas of the country and come into commercial marketing channels in quite different ways.

Production of Soybeans

Soybeans have been a major oilseed crop in the United States only for the past 25 years. Between 1940 and 1955, production of soybeans nearly quadrupled, and by 1955 it was almost twice as great as production of cottonseed (table 5). About 83 percent of the soybeans produced in 1955 came from the following 12 Midwestern States: Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Missouri, North Dakota, Nebraska, Kansas, and South Dakota.

Until World War II soybean oil was not well accepted in some sectors of the food industry. It came into wider use, however, as methods of processing and distribution improved. The great demand for fats and oils and for protein concentrate feeds during the war, and the assurance of favorable prices, brought forth constantly increasing crops of soybeans. Meal and oil each represents about one-half the value of soybean products, and the meal is generally accepted as a high-grade protein concentrate.

Soybean oil is consumed in all sections of the country, although, of course, transportation costs and the more convenient location of sources for other

10/ Current prices of different brands of margarine vary by as much as 18 cents a pound. Prices of hydrogenated vegetable shortening may vary by 10 cents per pound.

Table 5.--United States production of soybeans and cottonseed, 1940, 1945, 1950, and 1955

Year	Soybeans		Cottonseed		Soybean production as percentage of cottonseed production
	1,000 bushels	Million pounds	Tons	Million pounds	Percent
1940	78,045	4,683	5,286	10,572	44
1945	193,167	11,590	3,664	7,328	158
1950	299,249	17,955	4,105	8,210	219
1955	373,522	22,411	6,043	12,086	185

edible fats and oils are among the principal deterrent factors in its competitive market. In 1935 its use in shortening and margarine was relatively insignificant. By 1940, however, it accounted for 18 percent of all fats and oils used in shortening and a third of those used in margarine.

There have been Government price support programs for soybeans since 1941. The early programs were for the purpose of promoting production, the later ones for protecting farm income. During the latter part of World War II soybean processors were allowed a subsidy in order to obtain adequate soybean oil production and at the same time maintain price ceilings. This subsidy averaged about 20 cents per bushel.

The average farm value 11/ of an acre of soybeans in the State of Illinois rose from $27.66 for 1940 to a peak of $57.46 for 1945. The 1955 value was $43.88 per acre.

Production of Cottonseed

Cottonseed as a commercial oilseed has a much longer history than soybeans in the United States. In 1935 it already accounted for about one-half of the shortening and margarine oils, in competition with animal fats and imported vegetable oils; in 1940 it accounted for 65 percent of the total. In 1950 the amount used remained at about the level of 1940, although the total production of shortening and margarine had increased by nearly one-half.

Approximately 94 percent of United States production of cottonseed is in the following 12 Southern and Southwestern States: North Carolina, South Carolina, Georgia, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, Texas, Oklahoma, Arizona, and California. For the country as a whole there has been little increase in production in the past 20 years.

11/ These average values per acre for soybeans and cottonseed have been adjusted by the index of wholesale prices for all commodities.

The average farm value per acre of cottonseed rose from $9.38 for 1940 to $20.91 for 1945, and then to $21.15 for 1955. The price of cottonseed was first directly supported by Commodity Credit Corporation in 1949. In some industrial quarters it has been said that under the 1951-54 support program, prices of cottonseed oil were so high as to give soybean oil a competitive advantage.

Data for 1954 compiled from monthly reports of manufacturers to the Bureau of the Census show the importance of the competition between soybean and cottonseed oil for use in the production of margarine and shortening. With the rise of about 1.4 cents in cottonseed oil prices in October 1954 and the fall of about 2.7 cents in soybean oil prices between August and October, manufacturers turned from cottonseed oil to soybean oil. Use of soybean oil increased and use of cottonseed oil decreased for margarine in Georgia and California, and for shortening in New Jersey, Georgia, and California. Use of both oils increased in New Jersey for margarine and decreased in Illinois for margarine and shortening.

Some soybeans are stored on the farm, and the amounts stored have been increasing in recent years. In most years, most farmers who have stored soybeans at harvesttime for sale later in the season appear to have profited by doing so. With the rapid increase in the soybean crop it is not known, however, what portion of the increasing farm storage has resulted from study of seasonal price trends by farmers, and what part from the rush of harvest work and congestion of country elevator and railroad facilities.

The marketing schedule for the farmer's soybeans depends largely on the amount of small grains in storage on farms and in country elevators, and on the degree to which transportation facilities are occupied with small grain.

Soybean growers may store beans at the country elevator, or they may sell and deliver directly to the oil mill. Nevertheless, a major part of the soybean crop destined for processing is still hauled to the country elevator and sold by farmers at harvesttime.

The country elevator receives about 95 percent of the soybeans the farmers produce, and in turn delivers about 85 percent to the mill, either immediately or after a period of storage. Elevator managers commonly purchase soybeans as they are delivered by farmers, and protect themselves against loss in value of the beans by selling about the same amount to a processor or a dealer, or on an organized futures market. Beans sold to a miller or dealer may be shipped immediately or stored for later shipment on the buyers order. According to commonly accepted economic reasoning as applied to "normal" years, prices in the soybean market will rise enough, as the season advances, to pay the storage costs necessary to carry them.

Cottonseed as a separate commodity seldom appears on the farm. The cotton that farmers grow yields fiber and seed as joint products. As the seed cotton is picked it is delivered, load by load, to the gin. 12/ There the fiber and seed are separated and moved into divergent marketing channels.

12/ Whitten, M. E. and Stevenson, J. H. The Marketing of Cottonseed. U. S. Dept. Agr., Prod. & Mktg. Admin., Cotton Branch. 1949.

Seed from an acre of cotton may weigh 50 to 75 percent more than the fiber obtained and may bring farmers 25 to 50 percent as much as the fiber. Thus, a cotton crop obviously cannot be grown for the value of the seed. The value of the seed does not warrant a significant increase in production of cotton when the price of seed is high, nor a decrease when the price is low. At the gin farmers commonly sell both cotton fiber and cottonseed to the ginner, and pay for ginning.

Charges for ginning upland cotton advanced from $4.76 per 500-pound gross weight bale for the 1940-41 crop to $13.56 for the 1956-57 crop. 13/

Cottonseed cannot be stored for a long time without careful protection against deterioration. For this reason, the seed moves directly from gin to mill. Furthermore, the mill normally is close enough to the gin for the seed to move conveniently by truck.

Milling Practices and Costs

Milling Oilseeds

Soybean milling is done mostly in the central soybean States. The miller extracts the oil from the soybeans and converts the seed residue to protein cake or meal. He may use either a mechanical or a chemical method of extraction. The process may be complicated by extraction of lecithin or production of some special grade or type of meal or protein. Also, it may be integrated with further processing, such as refining the oil or mixing the meal into livestock feed. Sometimes integration reaches in the opposite direction, and encompasses country elevator operation.

Oil from all the mills goes into the general national supply. However, some small oil processing plants, located in isolated soybean areas and feed markets, have a freight advantage over outside suppliers of meal.

In the general market there is nationwide competition of meal much as there is of oil. The competitive position of mills appears to rest largely on (1) economies of plant size, (2) differential shipping privileges, (3) geographical location of plants, especially the convenient location of plants in a multiplant firm, and (4) security of markets through vertical integration. The shipping privileges consist of in-transit milling privileges whereby 80 percent of the weight of a shipment of beans to a mill, and the same quantity of meal moving from the mill in the same general direction, may receive a through rate from the source of the beans to the destination of the meal. These in-transit privileges affect the differentials in costs and margins among mills, and also the sources, channels, and destinations of soybeans and soybean meal.

13/ Fortenberry, A. J. Charges for Ginning Cotton. U. S. Dept. Agr. Mktg. Serv., Mktg. Res. Rpt. No. 120. June 1956.

U. S. Agricultural Marketing Service. Charges for Ginning Cotton, Costs of selected Services Incident to Marketing, and Related Information, Season 1956-57. U. S. Dept. Agr. May 1957.

Cottonseed milling comprises a more complex set of operations than soybean milling. As the cottonseed comes from the gin the fine, short fibers, or linters, that cover each seed may constitute one-tenth of the total weight. Delinting removes these linters from the seed by a modified ginning process, and is followed by removal of the hulls.

Hulls are not left with the meats during oil extraction because they would absorb some of the oil, which is the most valuable constituent of the seed. Hulling may yield 1,200 pounds, or somewhat more, of meats from a ton of cottonseed delivered to the mill. Thereafter, the process of oil extraction is approximately the same as for soybeans.

For many years oil was extracted from all cottonseed by hydraulic presses. When soybean oil came into use between 1930 and 1940, however, it was extracted by a continuous screw-press process which soon began to invade the cottonseed industry.

Now both processes are rapidly giving way to chemical extraction. This last process handled 23 percent of the soybeans in 1940 and 86 percent in 1954. Cottonseed presented more problems of adaptation, but by 1951 possibly 6 percent of the oil was solvent extracted, and by 1954 the percentage was about 30. Solvent extraction obtains a higher yield of oil than other methods, but costs more per ton of seed processed. With soybeans the process has definite advantages for all mill owners. With cottonseed the profit advantages have perhaps been restricted to the bigger mills.

The solvent process, of course, by slightly increasing the total supply of oil, tends to limit millers' gains from adoption of the method.

In 1954 there were 291 cottonseed oil mills reporting to the Bureau of the Census, compared with 88 soybean oil mills. Half of the cottonseed oil was produced in the Southwest by 39 percent of the mills, whereas one-fifth was produced in the Southeast by one-third of the mills. Both size of mill and transportation differences for the various locations can be expected to affect costs of oil.

Storage of Oilseeds and Their Products

Storage presents different problems with soybeans and cottonseed. The physical characteristics of soybeans, combined with the climate of the central soybean belt, make it practical to handle and store soybeans with the facilities, equipment, and practices employed with small grains.

This permits commercial storage at various points along the marketing channel, with the result that a soybean miller has the freedom to determine the extent to which he will buy beans ahead of his processing needs. Processors' policies vary widely. A miller can buy at harvest and store the beans either at the mill or in commercial storage. Then he can (1) hedge on the market, (2) sell his expected products for later delivery, or (3) hold the beans unhedged, hoping for a speculative gain from a price rise.

Elevator rates for soybean storage, which are similar to the Uniform Grain Storage Rates, are also related to terminal rates. Storage charges applicable under the act were 4.4 cents per bushel in 1950, and 6.9 cents in 1956, for 150 days of storage. 14/ These changes in rates represent an increase of 56 percent in storage costs.

Storage of cottonseed cannot be managed in the same way. Because the seed requires specially constructed storage houses with artificial ventilation, and because the operating season is short for many cottonseed oil mills, it is impractical to utilize commercial storage. The miller must procure practically his entire season's supply from October to December. It is commonly recognized in the industry that carrying this seed supply without some kind of market hedge is a speculative venture.

Comparison of the supply of seed stored by soybean mills with that stored by cottonseed mills, in terms of processing needs, requires caution. Stocks of soybeans at processing mills on November 30, 1955, equaled processing requirements till about March 15. Cottonseed in storage on November 30 was sufficient to fill most of the requirements to the end of the season. Actually, the monthly average quantity of seed stored at mills represents a greater portion of the season's crush for cottonseed than for soybeans. This results both from the appreciably shorter average operating season for cottonseed oil mills and from the commercial storage of soybeans. Stocks on November 30 usually represent a seasonal peak in storage of seed by both soybean and cottonseed oil mills. On November 30, 1955, storage of soybeans was 2,651,000 tons, and storage of cottonseed was 2,523,000 tons.

At a minimum, the mill must have storage capacity for enough seed to enable it to operate from 5 to 10 days. Nevertheless, storage in some position obviously must carry the oilseeds from harvest to crushing.

In addition to storing oilseeds, the mills must have facilities for storing their products. Usually the markets for oil, meal, and cotton linters do not fluctuate with enough amplitude and speed to justify much storage for speculative purposes. Both the soybean and cottonseed processing industries appear to market the bulk of their products as promptly as physically practicable. Facilities must be adequate to accumulate full carloads and to take care of temporary transportation or market failures. For example, mill stocks of soybean oil usually represent 8 to 10 days' output, but mills have oil storage capacities ranging commonly from 27 to 34 days' production.

To permit a favorable sale, the demand for oil at a given time must develop near the mill. Shipping the oil to some other market is expensive. By 1956, railroad freight rates for vegetable oil had increased over rates in 1940 by percentages ranging from 81 to 109.

14/ Equivalent to about 22 cents and 34 cents per 100 pounds of oil (refined basis) in the oilseed.

Milling Costs

No doubt certain milling costs, such as storage, transportation, and labor, have been increasing along with the general rise in prices. Between 1939 and 1954 wage rates rose sharply in both cottonseed and soybean oil mills, but in 1954 the cost of labor per unit of oil produced was less than in 1947 (table 5). Rates in cottonseed oil mills, being lower to start, made the greatest advance. In 1954, however, they were still 25 percent lower than wage rates in soybean oil mills. Labor costs per pound of cottonseed oil produced at that time were still twice as great as labor costs per pound of soybean oil, but this does not necessarily indicate less efficiency. Soybeans require no processes parallel to the delinting and hulling of cottonseed. There were about 3 times as many cottonseed oil mills, however, as there were soybean oil mills in 1954, and they produced 25 percent less oil than soybean oil mills produced (see page 31). Also, solvent extraction, the most efficient method, was used in 30 percent of the cottonseed mills in 1954, and in 93½ percent of the soybean mills.

Other costs were also higher in cottonseed oil mills in 1954. The total cost of raw material, fuel, electricity, etc., averaged 13.8 cents per pound in cottonseed oil mills, and 11.6 cents in soybean oil mills. These factors may explain to some extent why cottonseed oil had a lower value than soybean oil at the farm, and a somewhat higher value at the mill. In 1954 cottonseed oil mills expended 38 percent more for new plants and equipment than soybean oil mills; this may represent a trend toward increasing the relative efficiency of the cottonseed oil industry.

The estimates in the last column of table 6 indicate that, in 1954, mill profits probably were considerably reduced from 1947 levels.

Oil Processing Practices and Costs

Oil Refining

From the oil mill the soybean or cottonseed oil destined for use in margarine or shortening moves to an oil refinery. The movement generally is toward the anticipated market and consumption area. An estimated 10 percent of crude oil, however, is refined at or near the mill, and over 70 percent of the refined oil is utilized, in the end product or in further processing, so near the refinery that no transportation by tank car is involved.

The extent of this integration of physical movement affects the extent of the working stocks of oil that the industry employs. An integrated plant can move goods in process from one department to another without requiring large inventories as a protection against stoppage of market supply. At the close of 1955, processors held 58 million pounds of crude soybean oil and 70 million pounds of crude cottonseed oil. These figures represent the seasonal peak. A clear peak for crude cottonseed oil usually appears between November and February. For crude soybean oil a less definite peak usually appears in December or January.

Table 6.--Soybean and cottonseed oil milling costs and oil value per pound (refined basis), 1937, 1939, 1947, and 1954

Year	Proportion of value of shipment 1/			Value of 1 pound of oil 3/	Estimated milling costs per pound of oil		
	Wages and salaries	Materials, fuel, etc. 2/	Other		Wages and salaries	Materials, fuel, etc. 2/	Other 4/
	Percent	Percent	Percent	Cents	Cents	Cents	Cents
SOYBEAN OIL MILLS							
1937	4.9	82.1	13.0	---	---	---	---
1939	6.5	78.4	15.2	5.7	0.4	4.5	0.8
1947	3.2	82.0	14.8	22.5	.7	18.5	3.3
1954	3.6	87.1	9.4	13.8	.5	12.0	1.3
COTTONSEED OIL MILLS							
1937	5.9	80.9	13.3	9.4	.6	7.6	1.2
1939	8.7	80.9	10.4	6.5	.6	5.2	.7
1947	6.1	79.8	14.1	25.6	1.6	20.4	3.6
1954	7.9	81.5	10.6	17.5	1.4	14.2	1.9

1/ Value of shipments includes the value of oil, meal, and other products.
2/ Materials, parts, supplies, containers, fuel, electricity, and contract work.
3/ Computed from reported quantity and value of oil shipments (or production as available).
4/ Data in this column represent the margin, which covers all other mill costs and mill profits.

Compiled from the Census of Manufactures, U. S. Bureau of the Census.

Oil Storage

Storage of crude oil by the industry as a whole tends to vary fairly closely with production. For cottonseed oil it usually equals about 1 month's output at the production rate then current. Approximately a fourth of this, or 1 week's production, is at the oil mill. The remaining three-fourths mostly represents working inventory at refineries or other processing plants.

Crude vegetable oils, and especially cottonseed oil, are generally assumed to deteriorate more rapidly than refined oils.

Use of vegetable oils in the form of consumers' products is nearly uniform over the year. This uniform demand by consumers must be filled from crude oil

stocks after the peak rate of crushing is past. The extent of storage facilities required, both for oilseeds and for oils, is at a minimum, of course, when the processing is carried on evenly over the whole 12 months.

The three main steps at which oil is stored are (1) crude, (2) refined, and (3) hydrogenated.

Stocks of refined and hydrogenated soybean and cottonseed oil for the United States for the peak period in the 1955-56 crop year were:

Refined soybean oil	123,747,000 pounds
Refined cottonseed oil	417,399,000 pounds 15/
Hydrogenated soybean oil	42,587,000 pounds
Hydrogenated cottonseed oil ...	22,504,000 pounds

Production of crude soybean oil increased from 564 million pounds in 1940 to over 3 billion pounds in 1955; production of cottonseed oil increased from 1.4 billion pounds to about 1.9 billion pounds.

The rapid rate at which production of soybean oil has increased is obvious as compared with the smaller gains in production of cottonseed oil (figs. 8 and 9). More soybean oil than cottonseed oil is used in food. The widening difference between the use of these oils in all foods and their use in margarine and shortening indicates the recent increase in the use of cooking and salad oils as compared with margarine and shortening (figs. 8 and 9).

Basically the oil processing function of the vegetable oil refinery is that of removing free fatty acids and foreigh material by treating with an alkaki, followed by filtration. Normally, after the oil has been refined, it is water-washed to remove remaining alkali and any chemical products that have formed. (For many years the material removed was usually sold as soapstock; recently it has been used as an ingredient in livestock feed.) The oil is then turned into a vacuum dryer which reduces the moisture content to less than 0.1 percent. Fuller's earth is added as a bleach, and later removed when the oil passes through a filter press.

The refined, bleached oil is changed to a plastic solid by exposure to hydrogen in the presence of a catalyst. The process adds hydrogen to some or all of the oil molecules. Not all margarine or shortening oil is hydrogenated, however, if hard fats of the right characteristics are available for blending. Refining, bleaching, hydrogenating, deodorizing, and various special modifications of oil processing may be combined in numerous ways. Sometimes one plant, or several neighboring and integrated plants, will carry the oil through the series of operations and turn out consumers' goods.

Refining and Hydrogenation Costs

The refining and hydrogenation of oil usually take place in the same area as the manufacture of margarine and shortening. These processes are usually

15/ Includes 61,900,000 pounds of cottonseed oil reported owned by Commodity Credit Corporation.

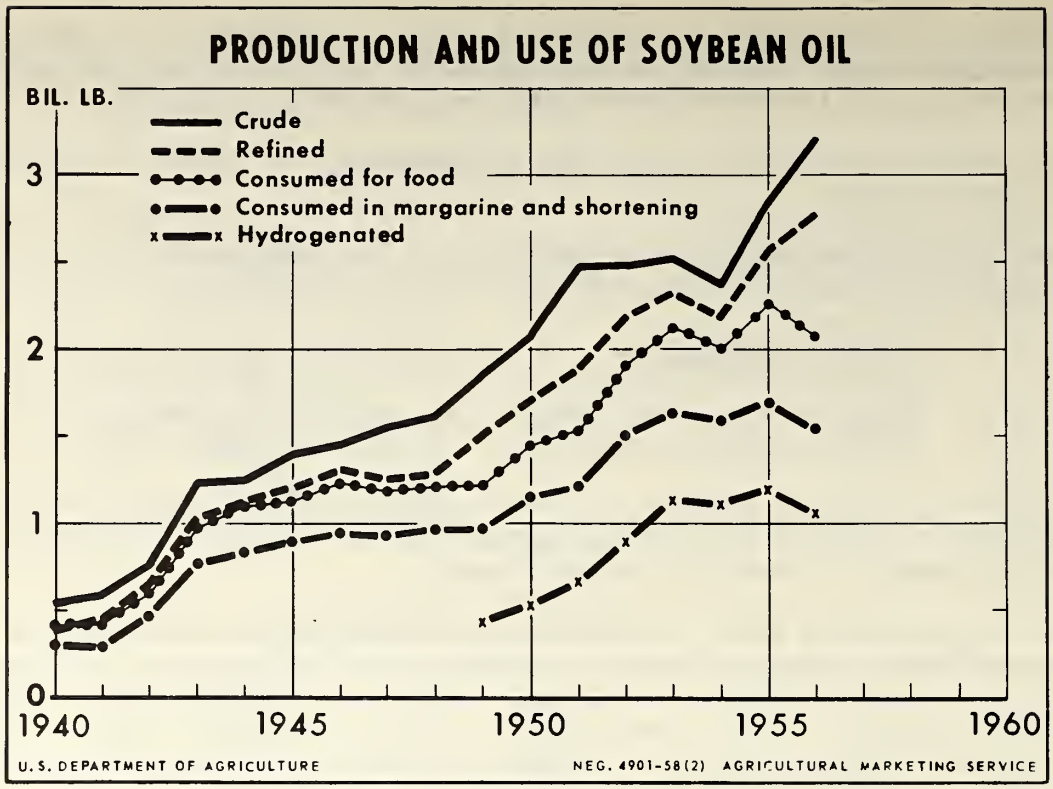


Figure 8

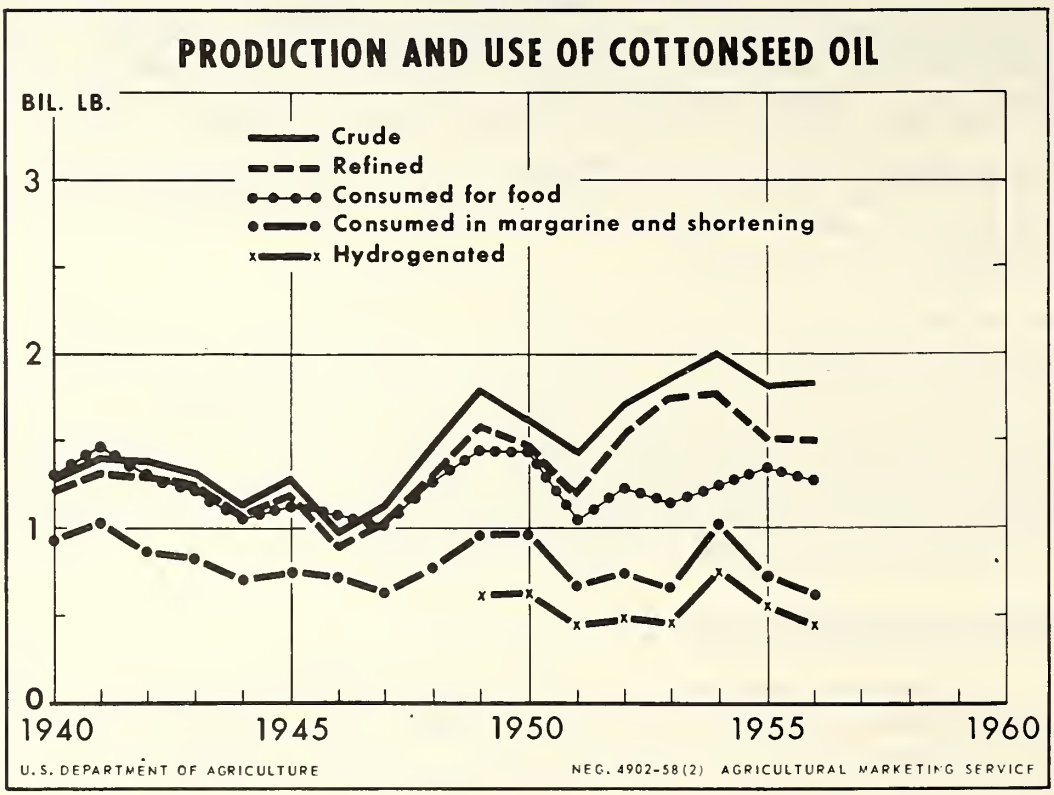


Figure 9

performed in large volume. The current margin between crude and refined oil is between 1 and 2 cents per pound. Loss due to shrinkage adds greatly to the cost of refining oil. Shrinkage loss is based on (1) the amount of shrinkage, (2) the market value of the crude oil being refined, and (3) the value of the byproduct foots. A shrinkage of 6 pounds per 100 pounds of refined oil produced, with crude oil valued at 12.60 cents per pound and vegetable oil foots selling for 2.66 cents a pound, represents a net shrinkage loss of about 0.6 cent per pound of refined oil. The estimated cost of refining cottonseed oil in 1949 was 0.69 cent per pound, of which 87 percent was shrinkage loss. 16/ Costs today may be slightly higher. The amount of shrinkage over the past 16 years has diminished substantially, being reduced by 3 to 4 pounds per 100 pounds of refined oil produced. The loss varies between crops and within the season. Although shrinkage has been reduced, the current market price of foots is low; hence, the price of refined oil must cover most of the cost of refining.

The cost of hydrogenating oil also varies between 1 and 2 cents per pound. The cost of hydrogenation of soybean oil was estimated to be approximately 1.23 cents per pound in 1949. Hydrogen represented 40 percent of this cost, and labor 20 percent (see footnote 16).

The total margin of refining and hydrogenation ranges between 2 and 4 cents per pound.

Margarine and Shortening Production and Costs

The food use of fats and oils in 1956 was about 96 percent of the 1940 level and represented an increase of 6 percent over the low wartime and immediate postwar levels (fig. 10).

The principal fats and oils products used for food in the United States are shortening, lard, vegetable oils, butter, and margarine, in order of amount used. Shortening and lard, which are cooking fats, are highly competitive. Vegetable oils have grown rapidly in popularity as both cooking and salad oils, which increased in use by 67 percent since 1940. Butter and margarine as table fats also compete for the consumer's food dollar.

Since 1940 the use of butter and lard has declined steadily, and the use of margarine, shortening, and cooking and salad oils has increased (table 7). Improved technology in the refining and hydrogenation of vegetable oils accounts for most of this increase in use.

Both vegetable oils and animal fats have been used in the production of margarine and shortening, but the use of animal fats has been decreasing since the early twenties. Domestic vegetable oils accounted for 97.6 percent of the total quantity of fats and oils used in margarine production in 1955, and animal fats for 2.4 percent; corresponding figures were 79.0 percent and 9.3 percent, respectively, in 1940. 17/

16/ Sills, Morris. Marketing of Nondrying Industrial Fats and Oils as Affected by Processing Methods. U. S. Dept. Agr., Prod. & Mktg. Admin. May 1952.

17/ In 1940, 11.7 percent of the oil used in margarine was imported.

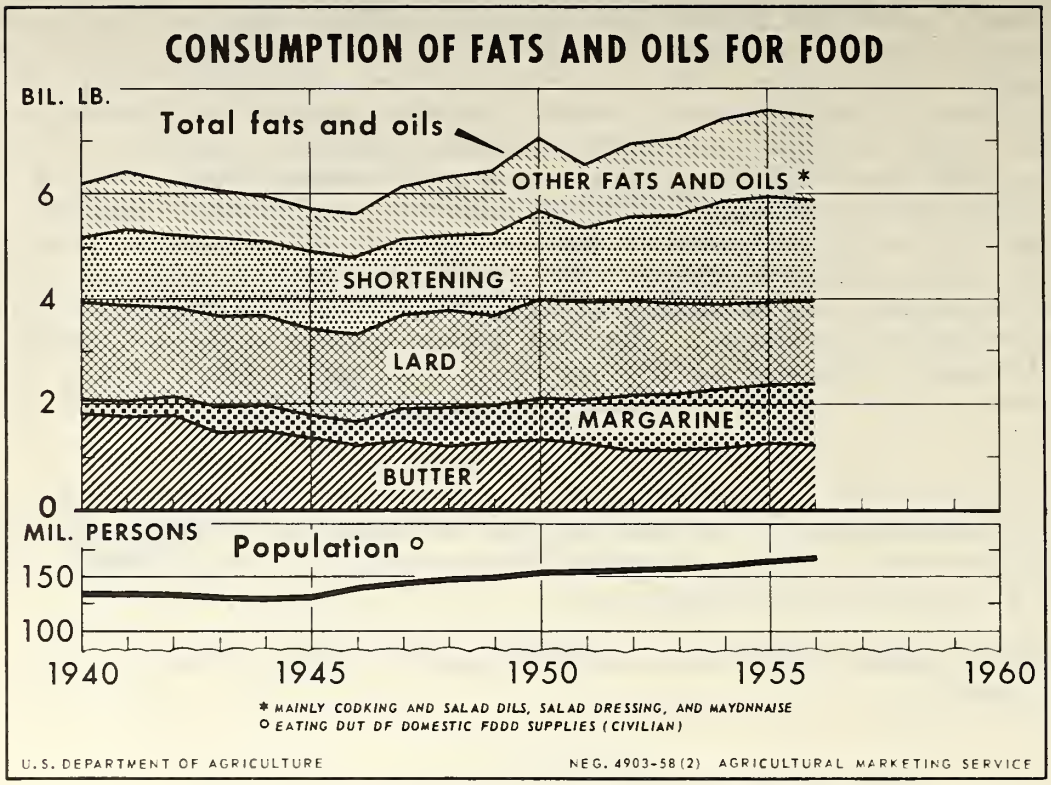


Figure 10

In quantity used, lard ranks next after soybean and cottonseed oils in the manufacture of shortening and margarine. Very little is used in margarine, but during January-June 1956, lard represented about one-fourth of all fats and oils used in shortening.

Margarine Production

All four of the producing areas used in our study are included among the 6 States that produced the largest volume of margarine in 1954, as reported by manufacturers to the U. S. Bureau of the Census. The 6 States were:

State	Production in million pounds
Illinois	208
Texas	192
California	167
New Jersey	151
Ohio	146
Georgia	80

Table 7.--Fats and oils used in margarine and shortening, 1940, 1945, 1950, and 1955

Commodity	Margarine				Shortening			
	1940	1945	1950	1955	1940	1945	1950	1955
Vegetable oil:								
Cottonseed ...Mil. lb..	116	254	418	278	823	487	549	439
Soybean .....do....	87	207	312	746	212	683	841	930
Total .....do....	203	461	730	1,024	1,035	1,170	1,390	1,369
Other .....do....	30	20	11	29	76	153	121	127
Total vegetable .....do....	233	481	741	1,053	1,111	1,323	1,511	1,496
Animal fat 1/ .....do....	24	18	23	22	85	133	194	492
Total vegetable and animal ....do....	257	499	764	1,075	1,196	1,456	1,705	1,988
Vegetable oil:								
Cottonseed .....Pct..	45	51	55	26	69	33	32	22
Soybean .....do..	34	41	41	69	18	47	50	47
Total .....do..	79	92	96	95	87	80	82	69
Other .....do..	12	4	1	3	6	11	7	6
Total vegetable .....do..	91	96	97	98	93	91	89	75
Animal fats and oils 1/ .....do..	9	4	3	2	7	9	11	25
Total vegetable and animal .....do..	100	100	100	100	100	100	100	100

1/ Contains small amount of fish oil.

Reports for 1954 indicate that there were about 56 manufacturers in the margarine industry, and that they produced 1,364 million pounds in that year; 43 manufacturers produced 344 million pounds in 1940. This growth undoubtedly was promoted by the removal of Federal and State excise taxes and restrictions on the production and sale of margarine, especially colored margarine, and the development of a greatly improved product.

Cottonseed oil was the major oil used in the manufacture of margarine until after 1951 (fig. 11). Increasing consumption of margarine, however, coupled with successful technological processes to retard the tendency of soybean oil to "revert" in flavor, and the availability of soybean oil at reasonable prices, increased the consumption of soybean oil. Of the total fats used in margarine in 1955, 69.4 percent was soybean oil and 25.9 percent was cottonseed oil. Other vegetable oils, which accounted for 2.7 percent of the total fats and oils used, were peanut, corn, and coconut oil, and vegetable stearine.

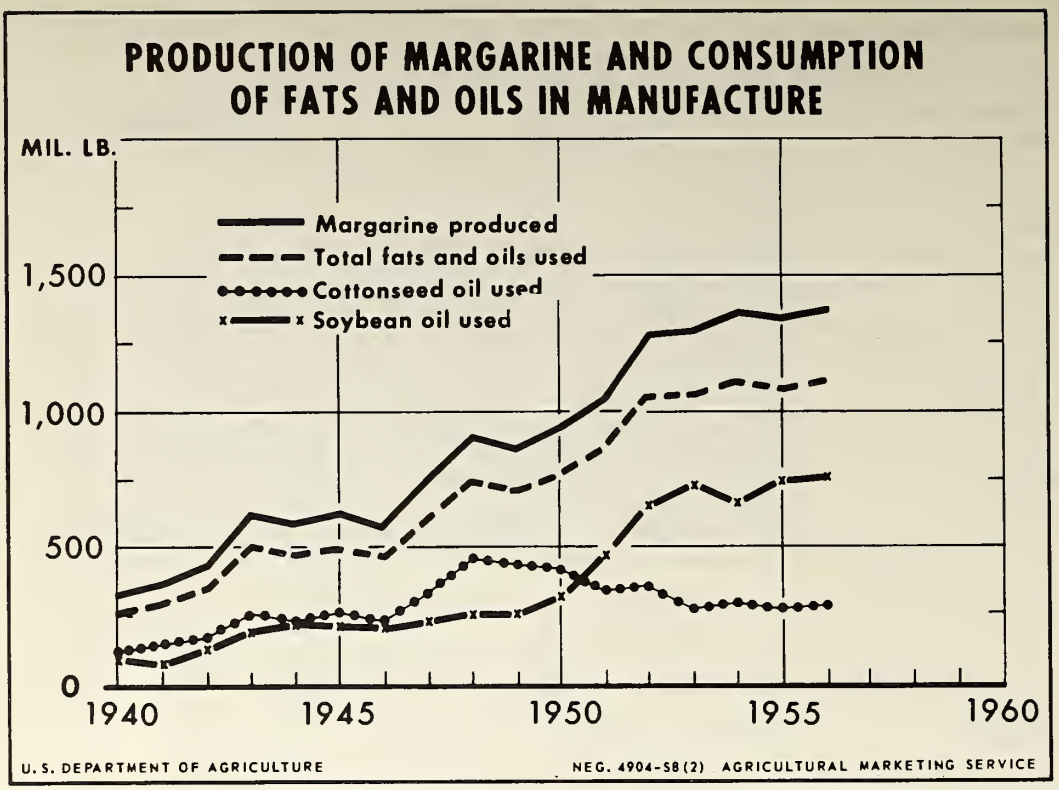


Figure 11

Selection of oils is based on market price and technical judgment. Each oil has its own unique characteristics when solidified. Furthermore, hydrogenation affects these characteristics uniquely in each oil. Practices in blending oils for margarine vary greatly. Frequently the blends are made at the refineries according to the specifications of the margarine manufacturer; thus, when the oil arrives at the margarine plant it may be piped directly to the production line. Manufacturers have facilities for storage of a limited amount of the mixed oil, but buying practices and changes in current oil markets are assumed by many to make it impracticable to hold more than a few days' supply.

The Federal Food, Drug and Cosmetic Act requires margarine to contain 80 percent of fat. The act also restricts the amount and type of most of the other ingredients used. Additional ingredients include milk, sodium benzoate or benzoic acid, lecithin, emulsifying agents, synthetic flavoring, coloring, vitamin concentrates, and salt.

The fluid skim milk that was formerly used to furnish milk solids and moisture has been replaced to a large extent by spray-dried nonfat milk solids and water. In 1944, according to data from 16 margarine manufacturers, 104 million pounds of fluid skim milk were used in the manufacture of margarine.

of which 85 percent was fluid separated milk and the remaining 15 percent was reliquefied nonfat dry milk solids. 18/

An emulsifying agent is needed in margarine to improve the consistency and to lessen spattering when the margarine is used in cooking. The agent may be lecithin, monoglycerides and diglycerides of fatty acids, or a synthetic emulsifier. United States Standards permit the use of not more than 0.5 percent of lecithin for this purpose. Small quantities of citric acid are often used as an antioxidant to preserve the quality of the fats and oils.

Industry welcomed the development of the synthetic flavoring agent diacetyl, which imparts a butter flavor and aroma. Formerly this flavor was obtained by the action of citric acid in the skim milk culture.

The addition of vitamins, especially vitamin A, and often vitamin D as well, increases the nutritive value of the margarine. In the early 1940's, 9,000 USP units of vitamin A were used, but today 15,000 USP units are required per pound of margarine. Vitamin D already contained in the vitamin A concentrate often is allowed to remain. Vitamin A may be furnished by concentrated fish liver oil or by synthetic products. The use of synthetic vitamin A eliminates the fishy odor and provides a stable, uniform supply at a reasonable price. Production of synthetic vitamin A yields a byproduct, pro-vitamin A, or beta carotene, which many margarine manufacturers have adopted because it is a combined coloring agent and a source of vitamin A.

There are 5 phases in the manufacture of margarine: Formation of an emulsion, solidification, kneading of crystals, forming consumer units, and packaging. Either of 2 manufacturing processes may be used; these are a continuous or votator process, and a batch or chill-roll process. The former, and newer, of the 2 processes appears to have taken over nearly the whole industry. It is reputed to have a cost advantage due to the use of a compact, enclosed unit which requires little handling of the product.

About 93 percent of the margarine manufactured today is packaged in 1-pound packages. 19/

Margarine wrappers and cartons were standardized as to color, shape, and size before World War II. The major types of packaging materials are vegetable parchment, greaseproof papers, and laminated aluminum foil. 20/

Data on the variations in prices of each of these types of wrapper are not available. The figures available do indicate, however, wide price differences between types and a great price increase since World War II.

18/ Cooke, H. L., and Day, G. H. The Dry Milk Industry, an Aid in the Utilization of the Food Constituents of Milk. American Dry Milk Institute, Inc., Chicago, Ill. 169 pp., illus. 1949.

19/ Facts for Industry, Fats and Oils. Monthly series: M 28-16-77 (formerly M 17-16). U. S. Bureau of the Census, 1951-1955.

20/ Surveys by the Paraffined Carton Research Council, Chicago, gave the following packaging costs per pound: (1) In 1946, 0.679 cent; (2) in 1953, parchment and carton, $0.0151; foil and carton, $0.0251.

Standardized package shapes reduce the cost of manufacturing, shipment, and handling. They also help the seller to make attractive displays. 21/

Machinery and labor constitute the largest share of packaging costs. The difference in packaging cost between a 1-pound solid print and a pound of quarter prints is less than half a cent. 22/ Price data are not entirely comparable historically because of improved quality of packaging material over the past 15 years. Most of the margarine packaged before 1950 was uncolored because of the 10-cent excise tax on colored margarine. A coloring packet usually was attached for the consumer's use.

Shortening Production

Shortening, unlike margarine, consists almost entirely of fat or oil. It is made either by the addition of oleosterine or edible tallow to vegetable oils or by hydrogenation, or by a combination of the two methods. A great number of blends is possible when several oils are used. As late as 1940 cottonseed oil was the major oil used, but it has since been partially displaced by soybean oil (fig. 12). In 1955, vegetable oils as a whole furnished 75 percent of the total fats and oils used; of the vegetable oils, 47 percent was soybean oil and 22 percent was cottonseed oil.

In 1955, 71 plants manufactured 1,975 million pounds of shortening. In 1940, 91 plants produced 1,190 million pounds. Reported production in 1954 for areas closely accessible to the 4 cities included in the study was:

State or area	Production in million pounds
New York-New Jersey	446
Illinois	254
Ohio, Indiana, and Wisconsin	329
Georgia	63
Other South Atlantic	298
California	204

In production of shortening, the fats and oils are refined, bleached, hydrogenated, and deodorized, and the melted oil is combined into mixtures to

21/ Maynard, H. H., and Davis, J. H. Cost Differentials in the Sale of Tub, Print and Carton Butter. Survey made by market consultants associated with the Ohio State University. Super Market Merchandising, Oct. 1948 issue. The following packaging costs were given, based on labor cost of $1 per hour:

Package	Cents per pound
Cartoned butter	0.13
Parchment wrapped butter	.79
Tub butter	1.58

22/ Based on correspondence with an authority on pcakaging costs.

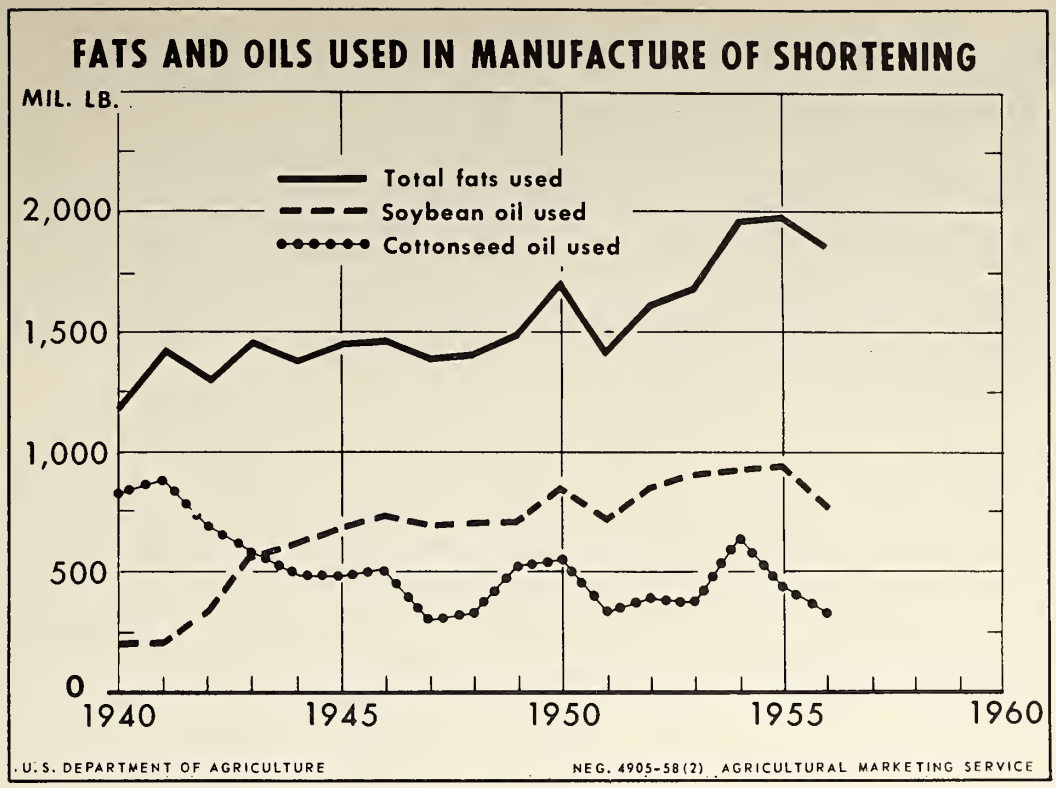


Figure 12

be solidified and packaged. The solidification process is similar to the one employed with margarine. "Superglycerinated" shortenings are made by adding 6 to 8 percent of a commercial monoglyceride and diglyceride to the preparation just before the end of the deodorization period. If antioxidants are used, they are added to the hot fat after it leaves the filter press, and are agitated for 15 to 20 minutes to be thoroughly mixed into the product.

The shortening is poured into a container in which nitrogen gas is used to displace the oxygen. A paper label may be affixed to the can, or the can itself may be lithographed. At one time, consumer-size containers ranged from 1 to 8 pounds, but today they are usually 1-pound and 3-pound cylindrical tin cans. One-pound cartons also were in wide use, at one time, but since the war they have nearly disappeared. Bulk shortening is packed in 50- and 110-pound cans and 400-pound drums.

To reduce transportation and handling cost for moving bulk shortening to the industrial consumer, liquid shortening is now being made. It is shipped in insulated steel tank cars. At the factory it is piped into the car, and at destination piped into a storage tank. This method saves much labor and transportation space. No data are now available, however, to support an estimate of the amount by which costs are reduced, and margins may be reduced, by this innovation.

Integration

Data available indicate that about 60 percent of the manufacturers were integrated horizontally to the extent of producing other products in addition to margarine or shortening. About 55 percent of the margarine plants and 85 percent of the shortening plants were operated by companies also operating oil refining facilities, and about 30 percent of the margarine manufacturing plants and more than 50 percent of the shortening manufacturing plants were operated by companies also operating soybean and cottonseed oil mills. To gain competitive advantage in the market for raw material, some large companies may even enter into transactions at the farm level.

Production Costs

Labor costs have changed little per unit of oil produced, although average wage rates advanced sharply in both margarine and shortening plants between 1947 and 1954. Weekly wage rates increased by 23 percent and 47 percent, respectively, in margarine and shortening manufacturing plants between 1947 and 1954, but there was little change in labor cost per pound of margarine or shortening produced (table 8). Labor and other costs per pound of oil in margarine were higher than those per pound of oil in shortening throughout the period. Since a pound of oil will produce $1\frac{1}{4}$ pounds of margarine and only 1 pound of shortening, margarine costs might be expected to be higher.

The estimates of cost calculated from the Bureau of the Census data for the manufacture of margarine and shortening and for oil milling are valuable as an indication of the distribution and the trend of these costs, but they are not suitable for direct comparison with the margins data reported earlier in this study.

EFFECT OF MARGARINE TAXES ON PRICE

All Federal taxes on margarine were removed on July 1, 1950. The first taxes were levied by the Federal Government on the manufacture and sale of margarine in 1886. The rates for colored margarine were increased in 1902, and these rates remained in effect until June 30, 1950 (table 9).

With repeal of the differential Federal tax on colored margarine, white margarine was rapidly replaced by colored in most States where it was not prohibited or restricted by taxes. On July 1, 1950, however, 15 States still prohibited the sale of yellow margarine and several other States taxed it. Of the States included in this study, Georgia had no prohibition against yellow margarine, California had a law that was repealed October 1, 1949, and Illinois and New York had laws that were repealed July 1, 1951, and July 1, 1952, respectively.

Even before removal of the Federal excise tax, the use of yellow margarine became widespread in many areas. During the 1940-41 fiscal year, $47,762 was

Table 8.--Margarine and shortening manufacturing costs, and oil value per pound (refined basis) in margarine and shortening, 1937, 1939, 1947, and 1954

MARGARINE

Year	Proportion of value of shipment 1/			Payment per pound of oil 3/	Estimated manufacturing costs per pound of oil		
	Wages and salaries	Materials, fuel, etc. 2/	Other		Wages and salaries	Materials, fuel, etc. 2/	Other
	Percent	Percent	Percent	Cents	Cents	Cents	Cents
1937	5.5	69.5	24.9	16.0	0.9	11.1	4.0
1939	8.5	63.7	27.8	13.1	1.1	8.4	3.6
1947	3.9	79.1	17.0	40.5	1.6	32.0	6.9
1954	5.4	77.9	16.6	25.9	1.4	20.2	4.3

SHORTENING

1937	3.4	85.3	11.3	11.7	0.4	10.0	1.3
1939 4/	2.9	82.7	14.3	9.6	.3	7.9	1.4
1947 4/	2.8	83.4	13.9	32.2	.9	26.8	4.5
1954 4/	4.5	81.2	14.3	23.2	1.1	18.8	3.3

1/ The value of shipments is the value of all products shipped, including margarine and shortening.

2/ Materials, supplies, containers, fuel and electricity, and contract work.

3/ Computed from reported quantity and value of margarine and shortening shipments (or production as available). Average payment received by the manufacturer per pound of oil (refined basis) in margarine or shortening.

4/ Made solely of vegetable oil.

Compiled from the Census of Manufactures, U. S. Bureau of the Census.

Table 9.--Federal taxes on the manufacture and sale of margarine, 1902-1950

Type	Excise taxes (per pound)	Annual license fees		
		Retail	Wholesale	Manufacture
Uncolored	¼ cent	$ 6	$200	---
Colored	10 cents	48	480	---
All margarine	---	---	---	$600

collected by the Federal excise tax on yellow margarine; by 1945-46 the amount was $1,841,522. During 1949-50, the last year in which the law was in effect, taxes amounted to $23,225,819 on sales of over 232 million pounds of yellow margarine in the United States. For 1949-50 about 93 percent of the proceeds of the Federal margarine tax came from the levy on the manufacture and sale of colored margarine.

After taxes on yellow margarine were removed, the average retail price in 23 cities dropped 9.4 cents per pound. At the same time, the average retail price on uncolored margarine increased 0.6 cent per pound in 19 cities where the sale of colored margarine was prohibited. Because rising prices for fats and oils, including margarine, tended to counteract the effect of repeal of the Federal tax, a price decline of 10 cents per pound was not expected and did not occur in most cities.

The price premium between colored and uncolored margarine before July 1, 1950, usually exceeded the 10-cents-per-pound excise tax. In August 1949, the differential averaged 11.2 cents for the 23 cities for which data were available. Part of the excess resulted from the additional cost of coloring margarine and packaging it in quarter-pound prints. The average difference between white pounds and yellow quarters was about 1 cent per pound wholesale in 1953. 23/

As State restrictions against yellow margarine were removed and yellow margarine took over the market, the Bureau of Labor Statistics ceased pricing white margarine and took up the pricing of yellow margarine. Since colored margarine could not be sold in Chicago before July 1, 1951, and in New York before July 1, 1952, oil values and margins for these cities for November 1950 and January 1951 were adjusted for the estimated premium between white pound packages and yellow quarter-pound prints.

23/ The National Provisioner, Chicago, published weekly. Wholesale price quotations for margarine, Mar.-Dec. 1953.

56

☆ U. S. GOVERNMENT PRINTING OFFICE: 1958 O - 464190

The marketing margin for soybean or cottonseed oil sold to the consumer in the form of margarine and shortening must cover the cost of many transactions, many miles of transportation, extensive processing, months of storage, large capital investment, and many technical and managerial skills. In spite of the many factors that affect margins or price spreads, a stable equilibrium exists between consumer markets for oils from widely scattered areas.

Since these price spreads are aggregate spreads, they do not show the great variations in margins for individual transactions or groups of transactions. They do, however, show the trend of margins from the high prewar level to the lower wartime levels, and the steadily increasing marketing charges of the present.

Farmers' values in soybean or cottonseed oil fluctuate more than either consumers' costs or marketing margins. During World War II, marketing margins narrowed significantly. After controls were removed, the price spreads increased rapidly until the general supply of fats and oils became adequate. This increase, however, largely reflected trading position and represented speculative gains rather than increased costs of processing and distribution. At present, margins are again widening; the increase in spread appears to be partly increased cost--including increased services--and partly an advantageous trading position of the marketing agencies.

* NATIONAL AGRICULTURAL LIBRARY
1022563473